News Quality and the Internet: An Economic Analysis

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Summary

This thesis studies the impact of the Internet on the newspaper industry with special emphasis on quality.

In pursuing this, I apply a model by Armstrong and Weeds (2007) where I compare the equilibrium outcomes when the competing newspapers are characterized by a mixed funding regime (e.g., printed newspapers) versus a pure advertising funding regime (online newspapers). Because costly investment in higher quality can be translated into higher prices to the consumer in the mixed funding regime, whereas this is not possible in a pure advertising regime, quality will, in this modelling environment, be higher for printed newspapers than for online newspapers. On the other hand, online newspapers will respond to more fierce competition by increasing quality, while printed newspapers will reduce price and keep quality unchanged.

However, there are several limitations to the model. Perhaps most importantly, due to different reading behavior for online news relative to printed newspapers, online advertising has proven less effective compared to its printed counterpart. Hence, advertising revenues per reader is lower in online newspapers than in printed newspapers. Since the gain in advertising revenues by attracting more readers following an increase in quality is small, online newspapers will have weaker incentives to invest in costly quality.

I also investigate how news diversity may be affected by going from a mixed funding regime to a pure advertising regime. It is clear that for a fixed quality level, online newspapers will have incentives to differentiate themselves minimally from their competitors. Printed newspaper (mixed funding) on the other hand will differentiate themselves to a larger degree as differentiation allows for setting higher prices. However, changing the assumptions, such as endogenous quality and allowing for more newspapers, may give different results.

The main conclusion of this thesis is that news quality, measured as costly news production (e.g., ratio of self-produced content, use of multiple sources, investigative journalism), is lower online than in printed newspapers. An implication of this may be a reduction in positive externalities provided by quality news production.

Preface

I would like to thank my supervisor, Tore Nilssen, for valuable feedbacks and encouragement. I would also like to thank my family and friends for occasionally getting my mind off this thesis.

All the errors in this thesis are, of course, my responsibility.

Table of contents

1. Introduction

In recent years, the newspaper industry has been struggling. The circulation of printed newspapers has decreased substantially, and free online news outlets have become increasingly popular. In the U.S., several newspapers have been closed down, and in Norway the major newspaper companies have experienced cut-backs and lay-offs of journalists. In most countries, newspaper publishers are faced with declining advertising revenues and reductions in circulation and news titles.[1]

The newspaper industry is undergoing a transition amplified by the Internet. As more readers migrate online, sales of printed newspapers are declining, which means lower revenues from both sales and advertising. Because online advertising has proved less effective, newspapers are having a difficult time compensating for the lost revenues in the printed market online. Quality news content is a source of positive externalities which has proven to be vital in a working democracy. One of the main concerns is that the recent development in the newspaper industry may compromise the newspapers' ability to deliver high-quality, diversified news content.

In this thesis I study the impact of the Internet on the newspaper industry with special emphasis on quality, with the Norwegian and the U.S. industry as examples. In pursuing these issues, I use a model by Armstrong and Weeds (2007) where printed newspapers are located on a Hotelling line and are funded with a mix of sales revenues and advertising revenues, and online newspapers are funded solely by revenues from advertising. Readers' preferences depend on newspaper prices, the amount of advertising, and quality, where quality is assumed costly to produce. It is shown that in the case of printed newspapers, the quality level and the amount of advertising coincide with the socially optimal outcome, whereas online news outlets tend to have too low quality and too much advertising. In the eyes of the consumers, it is uncertain what regime is preferred as there is a trade-off between prices, quality, and the amount of advertising. Moreover, the model suggests that increased competition leads to increased quality online, whereas for printed newspapers, quality is unaffected, but will lead to a price reduction.

Based on the theoretical analysis and a discussion based on facts and other literature, I find that news quality is primarily affected through two channels when going online: (1) As the newspapers usually are not able to charge readers for content online, it becomes difficult to extract readers' surplus by increasing the price following an increase in quality, and (2) online reading

1 OECD (2010), p. 6.

behavior differs from offline reading behavior which affects both the newspapers' incentives towards news production as well as the value of advertising spaces.

Furthermore, the newspaper's incentives towards differentiation may differ in a purely advertising based business model (online news) relative to the traditional mixed funding regime. As price competition disappears online, newspapers may have incentives to choose minimal differentiation from competing news outlets. However, as there usually exist a larger number of news providers online, it can be argued that diversity in fact may increase. Moreover, as low differentiation may lead to more fierce competition in terms of quality, it can be argued that there exists a trade-off between quality and diversity for online news.

The rest of the thesis is structured as follows: In part 2, I present a short introduction to the rise of newspaper publishing and the newspaper business model, and the importance of quality news content. Further, I will describe the main features of the development of the newspaper industry in the U.S. and in Norway and how the industry in these two countries has been affected by the recent market turnover. Moreover, I discuss the impact of Internet and its implications for quality, especially of online content. The theoretical model is introduced in part 3. Limitations, possible extensions and a potential trade-off between quality and diversity online are discussed in part 4. Part 5 concludes the thesis.

2. The newspaper industry and the role of newspapers

2.1. Rise of newspaper publishing and the newspaper business model

The history of newspaper publishing is characterized by a close interaction between technological and social changes. The invention of modern printing technology which presented the opportunity for mass-production of written material,[2] social changes during the 18th century such as rising literacy and a growing middle-class, and the development of a postal system, laid the foundation for the growth of the newspaper industry.[3]

Traditionally, there have been three sources of income for the newspaper industry: subscription revenues, income from newspaper stands, and advertising revenues. Thus, newspapers serve two distinctive groups, readers and advertisers, where newspapers act as an intermediary between these two groups. Information and news content is delivered to the readers, and the readers' attention is sold to the advertisers, who would like to reach as many potential costumers as possible. It is therefore often said that newspapers act as a "platform" in a two-sided market, with readers on one side of the market and advertisers on the other. In the last few years there has been an increase in the literature on two-sided markets and its implications for pricing. In a two-sided market the pricing on each side of the market depends not only on the demand elasticities and marginal costs on the corresponding side of the market, but on the joint set of demand elasticities and marginal costs (see e.g. Rysman (2009) for a nice introduction to pricing mechanisms in two-sided markets). The platform might set a price that is below marginal cost to one of the groups if this side is relatively more price elastic and their participation attracts a great number of participants on the other side, who are relatively price inelastic, and therefore have a higher mark-up.

Applied to the newspaper market, low newspaper prices attract readers, which leads to higher participation and higher prices for the advertisers, who are on the other side of the market. The increased value on the advertising side of the market increases the value of having more readers, which leads to a bigger decrease in the price on newspapers. In many instances, the revenues from the reader side of the market are not enough to cover the costs of content production, printing and distribution, and so revenues from the advertising side are used to fund the newspaper and its

2 "History of publishing", *Brittannica*: http://www.britannica.com/EBchecked/topic/482597/history-of-publishing, accessed March 30, 2012.
3 OECD (2010), p. 15.

content. Hence, in many cases the newspaper business model is characterized by advertising revenues cross-subsidizing news production, printing, and distribution.

I will now turn to a short introduction of the newspaper industry in the U.S. and in Norway. The development of the newspaper industry in the two countries bear similarities, however there are some distinct differences between those two, especially when it comes to the position of newspapers, reading habits, and government support. Because of these differences, the digital revolution may have different industry effects in the U.S. and in Norway.

2.2. The U.S. newspaper industry

Prior to the 20th century, most American newspapers were family-owned and served quite small audiences of about 15-20%, depending on geography, literacy, and economic development.[4] The audience the newspapers served often represented the politically and economically viable citizens of the community.[5] Subscription prices were usually high, but affordable by the core audience, who mostly funded the newspapers and its content.

The heavily advertising funded newspaper business model of American newspapers developed alongside the Industrial Revolution, urbanization, expanded literacy among the population, and the creation of the penny press (inexpensive papers sold by street vendors).[6] Lower newspaper prices increased the newspapers' readership, but did not offset the cost of producing content and distributing the paper. However, because advertisers' value of ad spaces are increasing in the number of readers, the loss in revenues from papers sold was offset by increasing advertising revenues. The resulting advertising revenues made it possible for the newspapers to keep the price on their newspaper down and to invest in newspaper content, which increased the quality of the paper and therefore attracted even more readers and advertisers.[7]

From the 1950s to around 2000, the U.S. newspaper industry was a high-margin, profitable industry. In 1983, the total circulation of daily newspapers in the U.S. reached its maximum at 63.3

4 Picard (2004), p. 58. All the numbers in section 2.2. and its connected subsections are taken from Picard (2004), if not stated otherwise.
5 Ibid., p. 58.
6 Kirchhoff (2009), p. 2.
7 Park (2010), p. 372; "Reinventing the Newspaper", *The Economist,* July 7, 2011: http://www.economist.com/node/18904178, accessed February 5, 2012.

million spread among 1,701 newspapers,[8] and in 2000, profits peaked at 22.7%.[9] Compared to other industries, the newspaper industry has been doing extremely well, and at some point even surpassed the pharmaceutical industry, the metal industry, the aircraft industry, the auto industry, department stores, and grocery stores in terms of profits.[10] The success of the newspaper industry in terms of profits is attributed to several changes in the market conditions facing the newspapers after the Second World War. I will come to this in the next section.

2.2.1. The upswing

In 1952, the total number of daily newspapers reached its peak at 1,786.[11] In 1983, this number had fallen to 1,701, and in 2000, the number was down to 1,480 dailies.[12] The bankruptcy of several secondary newspapers from the mid-20th century,[13] coupled with the expansion in the advertising industry after the Second World War, benefited the remaining newspapers as they often became the sole newspaper in the relevant market and therefore one of the biggest beneficiary of the growing demand for advertising spaces.[14] The majority of newspapers were therefore local monopolies, and the newspapers were able to raise the circulation price 30-40% above the previous levels, and increase the rates for advertising about 20-30%. This led to a steady growth in advertising revenues for the newspaper industry.

The industry's dependence on advertising increased in the second half of the 20th century, from 71% of total industry revenues stemming from advertising in 1956 to 82% in 2000. In 1950, the bulk of the advertising revenues to the industry came from retail advertising (advertising that promotes local companies' and merchandisers' goods and services), at around 57%. The two other categories of advertisement, national (advertising for companies that have a nationwide target) and classifieds (brief advertisement appearing alongside with other ads of the same type, i.e. real estate ads, automobile ads, employment ads), accounted for around 25% and 18%, respectively. As the television sets started to enter American homes after the Second World War, the composition of the advertising categories making up for industry revenues started to change. The importance of retail

8 Picard (2002), p. 16.
9 Kirchhoff (2009), p. 4.
10 Picard (2004), p. 56.
11 Picard (2002), p. 16.
12 Ibid., p. 16.
13 Secondary newspapers are papers that are the second largest at their places of publication.
14 Picard (2004), p. 56.

advertising started to diminish as more national advertisers would rather display their advertisements on broadcast television to reach a larger share of the population at the same time. In 2000, retail advertising and classifieds accounted for 44% and 40%, respectively, while national advertising only accounted for 16%.

With the introduction of television, local newspapers lost ground in terms of national advertising, but because there were limited options for local advertising and classifieds, the local newspapers still enjoyed some market power in its respective local area and were able to maintain their profits by continuing to charge high prices to the advertisers.

The increased profitability of newspapers during the second half of the 20th century made it possible for some newspaper owners to form newspaper groups. An industry that was characterized by small, family-owned newspapers, soon became an industry dominated by large media conglomerates.[15] In the years between 1960 and 1980, 57 newspapers were sold to the *Gannett Company*, and by 1977, 170 newspaper groups owned two-thirds of U.S. daily newspapers.[16]

2.2.2. The downturn

The last decade has been devastating for the U.S. newspaper industry. Reports about declining readership, circulation and advertising revenues have led to gloomy predictions about the survival of the printed newspaper industry by media observers and newspaper editors.[17] According to the annual report on U.S. journalism undertaken by the Pew Research Center's Project for Excellence in Journalism (2011), total advertising revenues to the newspaper industry had fallen to $22.8 billion in 2010, accounting for a decline of 53% in a decade (advertising revenues peaked in 2000 at $48.7 billion). The evolution of advertising revenues from 1985 to 2000 is shown in *figure 1*. In 2010, profit margins for a typical newspaper were around 5% (which is less than a quarter compared to profits in 2000).[18]

The newspaper industry's increased dependency on classified advertising in the second half of the 20th century made the industry highly profitable, but also more sensitive to economic changes

15 Neiva (1995), p. 22.
16 Kirchhoff (2009), p. 3.
17 "Out Of Print: The death and life of the American Newspaper, *The New Yorker*, March 31, 2008: http://www.newyorker.com/reporting/2008/03/31/080331fa_fact_alterman, accessed February 28, 2012; "Top business-news execs express pessimism about newspapers, print", *Reynolds Center*, October 13, 2011: http://businessjournalism.org/2011/10/13/top-business-news-execs-express-pessimism-about-newspapers-print/, accessed February 28, 2012.
18 Pew Research Center's Project for Excellence in Journalism (2011).

because classified advertising tends to be more cyclical and volatile to changes in the economic environment compared to brand advertising.[19] Much of the decline in advertising expenditures can be attributed to sharp drops in classified advertising due to the recession in the early 2000s and the financial crisis in 2008, and to the shift of advertisers to digital platforms.[20] The development in classified advertising revenues is seen in *figure 2*.

Circulation revenues have also been declining, although not at the same rate as advertising revenues.[21] Unlike the new trend of declining advertising revenues the last decade, circulation revenues have not grown since the 1980s.[22] This may be due to the increase in competition for audiences facing the industry from radio and television, or changes in social, political, or cultural factors.

In 2009, a total of seven newspaper companies went bankrupt, including *The Tribune Company,* the nation's second-largest newspaper publisher.[23] A report by the USC Annenberg Center for the Digital Future (2012) predicts the death of most American newspapers within about five years.

19 Picard (2002), p. 26.
20 Pew Research Center's Project for Excellence in Journalism (2009).
21 Pew Research Center's Project for Excellence in Journalism (2011).
22 Picard (2002), pp. 14-15.
23 Kirchhoff (2009), pp. 7-8.

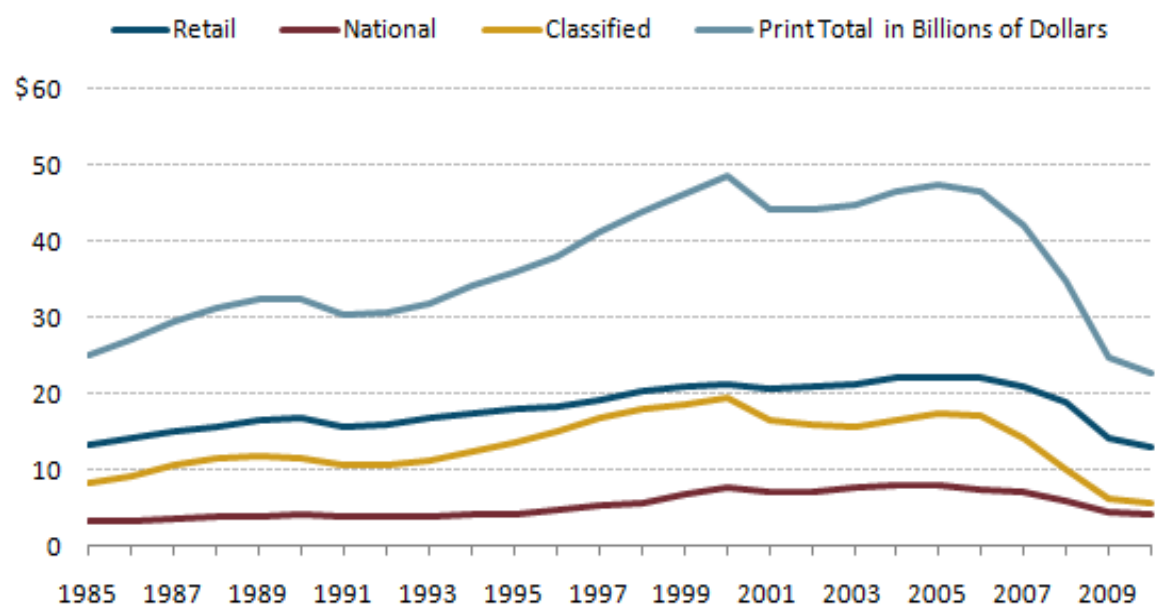

Figure 1: Daily advertising revenues for U.S. newspapers, 1985-2010 (in billions of USD)
Source: Pew Research Center's Project for Excellence in Journalism (2011)

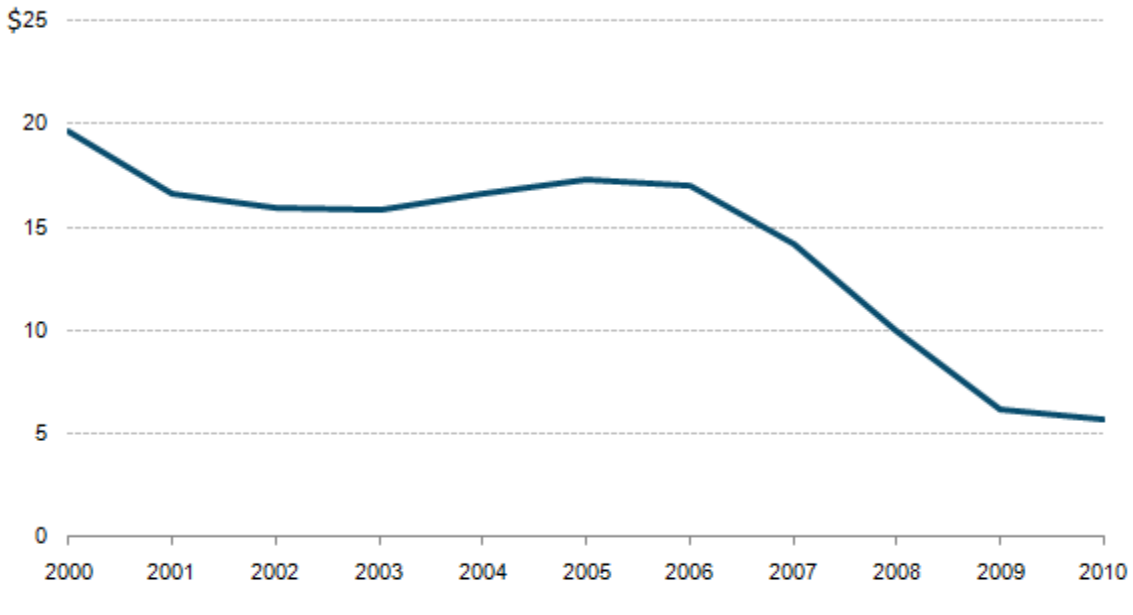

Figure 2: Total classified print advertising revenues for U.S. newspapers, 2000-2010 (in billions of USD)
Source: Pew Research Center's Project for Excellence in Journalism (2011)

2.3. The Norwegian newspaper industry

The Industrial Revolution, the decline in illiteracy, and the growth of political parties and interest in politics, all laid the foundation for the growth of the Norwegian newspaper industry. Historically, the Norwegian newspaper industry consisted of small, family-run newspapers, and most newspapers were affiliated with a political party. The rise of the partisan press was a natural consequence of the establishment of the political parties during the 1880s and onwards.[24] Typically, most cities had two or three partisan papers competing against each other,[25] and newspaper editors and journalists were for most parts politically active and used their paper to "promote" their respective parties' opinions and policies.[26] From the mid-1960s, the political ties were gradually loosened. From 1966 to 1990, the share of newspapers affiliated with a political party decreased from 64% to 32%.[27]

2.3.1. Newspaper deaths and the introduction of press subsidies

From the early 1950s to the early 1970s, the Norwegian newspaper industry experienced a declining interest in news, and the period was characterized by a reduction in newspaper consumption and decline in the number of secondary newspapers. In 1952, there were 42 seconday papers, and by 1972, this number had been reduced to 30.[28] The Norwegian Press Subsidy was introduced in 1969 to prevent newspaper deaths (which had occurred in Denmark and Sweden) and monopolization in the newspaper market, and in that way maintain a differentiated Norwegian press.[29] The press subsidies also made the Norwegian industry less dependent on advertising revenues compared to the U.S. industry.[30]

24 The first Norwegian political party was *Venstre*, which was established January 28, 1884.
25 Høst (1999), p. 115.
26 NOU (2010: 14), p. 55.
27 Ibid., p. 55.
28 Høst (1999), p. 115.
29 Skogerbø (1997), p. 102; Høst (1999), p. 118; NOU (2010: 14), p. 29.
30 I did not find concrete numbers on the Norwegian industry's dependence on advertising revenues. However, it is reasonable to assume that the Norwegian industry is quite similar to the other Nordic industries. According to a report by OECD (2009), in 2008, advertising revenues contributed to 87% of the revenues in America, while the number was 54%, 53% and 38% in Finland, Sweden and Denmark, respectively.

2.3.2. "The Golden Age" and the downturn

The decline of the 1950s and 60s was followed by an expansion from the 1970s to about 1994. Especially the 1970s and 1980s were characterized by a rapid growth in the newspaper market, by some known as "the golden age" of newspapers.[31] Between 1972 and 1997, the number of newspapers increased from 199 to 221.[32] Furthermore, the Norwegian newspaper industry experienced a change in the concentration of ownership in the early 1980s, and as of today, three media groups or conglomerates dominate the Norwegian newspaper industry; *Schibsted* (owns, among others, *Aftenposten* and *Verdens Gang,* two of Norway's largest newspapers,), *A-Pressen*,[33]and *Polaris Media.*

However, similarly to the experience of U.S. newspapers, Norwegian newspapers are experiencing tougher market conditions, and Norwegian media scholars have expressed concerns about the future of the Norwegian newspaper industry.[34] From 2005, there was a clear trend of declining news consumption and circulation, but most importantly of advertising revenues.[35] Newspaper advertising revenues reached its peak in 2007. In 2009, ad revenues had shrunk by 23%. [36] As a response to the economic difficulties, the Norwegian newspaper industry has downsized its workforce, especially of journalists. Between 1997 and 2006, the number of employed in the newspaper industry declined by 53%.[37]

Newspapers that are only sold as single-copies have especially taken a hit in the industry turmoil. According to the Norwegian Media Businesses' Association (in Norwegian: Mediebedriftenes Landsforening (MBL)), single-copy newspaper circulation declined by 6.7% in 2011, while the number of subscribers declined by 2.3%. During the last decade, the two largest single-copy newspapers, *Verdens Gang* (*VG*) and *Dagbladet*, have accounted for about 45% of the total decline in circulation.[38] *Figure 3* shows the decline in readership for some of the largest

31 Wilberg (2009), p. 30.
32 Høst (1999), p. 117.
33 In 2011, *A-Pressen* bought the Norwegian media group *Edda Media*. The acquisition is currently being evaluated and treated by the *Norwegian Media Authority* ("Medietilsynet"), and the matter will be finalized in May/June, 2012.
34 "Kraftig lut til tøffe tider", *Aftenposten*, February 11, 2010: http://www.aftenposten.no/meninger/debatt/article2918730.ece#.T28r8TFmJm1, accessed February 28, 2012; "Frykter tabloid-død", *Forskning.no*, June 24, 2009: http://www.forskning.no/artikler/2009/juni/223542, accessed March 1, 2012.
35 Høst (2011), p. 34.
36 Ibid., p. 5.
37 OECD (2010), p. 20. Between 1997-2007, employment in the U.S. decreased by 12%.
38 "Opplaget 2011: Nett og mobil vokser – Fortsatt svikt på papir", *Mediebedriftenes Landsforening*: http://www.mediebedriftene.no/index.asp?id=114050, accessed March 16, 2012.

newspapers in Norway.

The relatively strong position of subscribed newspapers may be attributed to the reading behavior in Norway. Until 2004, Norway had the highest per (adult) capita newspaper reach worldwide,[39] and in 2009, Norway had a daily newspaper reach[40] of 82% compared to 45% in the U.S.[41] In 2007, seven in ten household in Norway had a subscription of at least one newspaper, where about 64% subscribed in the big cities and 75% in the more scarcely populated areas.[42]

Moreover, local newspapers are still popular in Norway. The majority of the rural population in Norway has "always" lived there. This is closely related to strong political will in Norway to preserve the Norwegian cultural landscape and to create and uphold regional policies meant to preserve the main features of the traditional residential pattern. The local paper is therefore often regarded as a very important part of the community.[43] In the U.S., on the other hand, migration patterns are highly different, with the average American moving 11.7 times in a lifetime.[44] For that reason, Norwegians are more strongly linked to their local newspaper, which may partly explain the less severe decline in subscribers, as most local newspapers are mainly sold by paid subscription[45].

What might be a surprising trend of the last couple of years is the increase in the circulation of niche newspapers. The leftist newspaper *Klassekampen* reached a personal circulation revenues record in 2010, after eleven years of rising circulation figures.[46] The same trend is also seen for some of the niche weeklies (e.g. *Morgenbladet* and *Dag og Tid*). After two years of gloomy outlooks, total industry advertising revenues actually increased in 2011, which has brought a slight optimism to the Norwegian newspapers industry.[47]

The economic difficulties of the newspaper industry, both in the U.S. and in Norway, has been amplified by the digital revolution since much of the decline in readership and advertising revenues can be explained by the migration of readers to digital news platforms and the limited success of online advertising for the news outlets. One of the biggest concerns is that the economic difficulties experienced by the newspaper industry will affect the quality and diversity of the content

39 Bruns and Himmler (2011), p. 8.
40 All adults claiming to have read a newspaper recently/the day before.
41 OECD (2010), p. 29.
42 Bruns and Himmler (2011), p. 8.
43 Høst (1999), p. 123.
44 "Population Profile of the United States", *U.S. Census Bureau*: http://www.census.gov/population/www/pop-profile/geomob.html, accessed March 23, 2012.
45 Høst (1999), p. 114.
46 Høst (2011), p. 7.
47 Høst (2011), p. 5.

supplied by newspapers.[48] In the next section I will define *quality* and explain why quality news content is important to preserve.

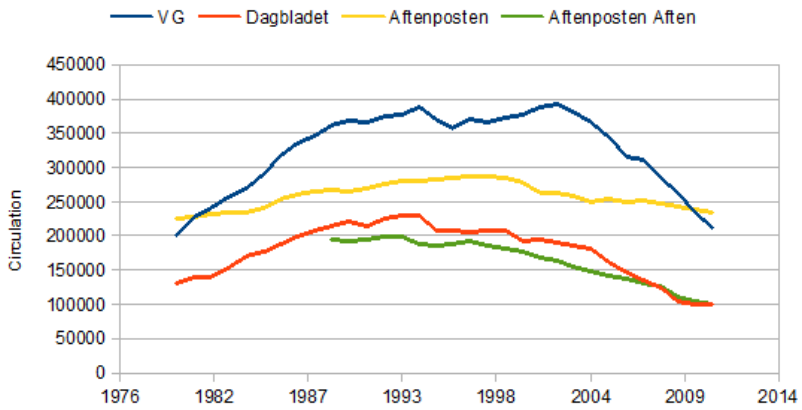

Figure 3: Circulation numbers for four of the largest regional newspapers, 1980-2011 (1989-2011 for Aftenposten Aften) – VG and Dagbladet are only sold as single-copies
Source: Norwegian Media Businesses' Association (MBL)

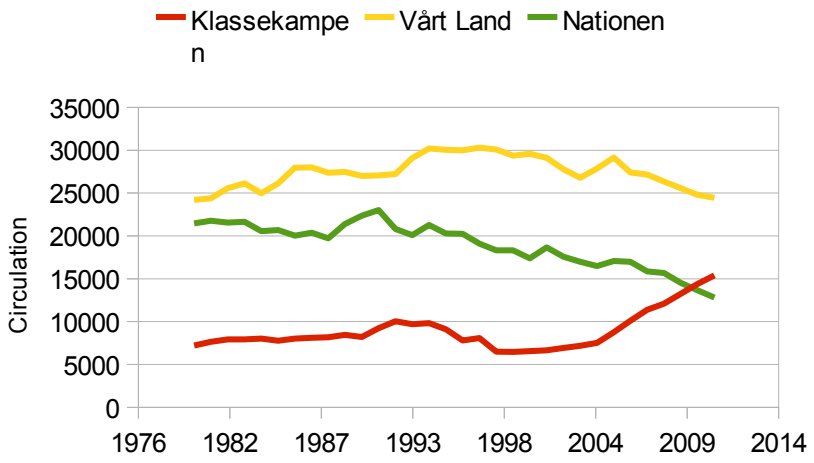

Figure 4: Circulation numbers for three niche newspapers, 1980-2011
Source: Norwegian Media Businesses' Association (MBL)

48 OECD (2010), p. 12.

2.4. The importance of quality journalism

Defining quality of news content is a quite subjective matter, however there is a high degree of consensus among scholars (see e.g. Picard (2004); Zaller (2003)) that quality journalism should be of social, cultural or political significance, e.g. news content that ensures the role of newspapers as "watchdogs" over government and as promoters of participatory democracy. According to Picard (2004), research has shown that amongst newspaper editors, the higher ratio of self-produced content to purchased material, the higher ratio of editorial material to advertising, and coverage of local news are all seen as important factors in quality journalism because it secures a higher degree of accuracy and diversity of the opinions expressed in the media, which helps the newspapers to fulfill their roles in a democracy. In addition, it has been argued that the use of multiple sources helps provide accuracy, representativeness and broadness in the coverage of an issue, in addition to eliminating biases which may occur when one source is chosen over another.[49] The use of multiple sources has also been stated in the Ethical Code of Practice for the Norwegian Press (in Norwegian: Vær Varsom-plakaten), which was adapted in 1936 by the Norwegian Press Association (in Norwegian: Norsk Presseforbund). In this section I will explain how quality journalism may have positive effects on the society as a whole through positive externalities to the readers and between newspapers.

It is an universal agreement that an open and well-functioning press is crucial in order to preserve freedom of expression and speech, and for democracy to work effectively. Modern society is characterized by an overwhelming mass of information, and in order for citizens to understand and respond to the world of public affairs, they need an intermediary that can interpret and make politics and public policies understandable for the citizens that it affects. Newspapers have the ability to put important issues on the agenda, and one of the most important roles of current newspapers is to sort, simplify, and present relevant information in a way that is understandable for common people.[50] In this regard, journalism can be interpreted as a type of research which foster knowledge and information for ordinary citizens that do not have the time or capacity to acquire knowledge and information for themselves. Thus, newspapers help to inform and update the citizens, which increases human capital and assists democracy to work more effectively because informed citizens make better decisions, not only for themselves, but also for their children and in

49 Carpenter (2008), p. 6.
50 NOU (2010: 14), p. 54.

political elections.[51] By making information available and understandable for ordinary citizens, newspapers and the press help the citizens to become active participants in the democracy. A vital prerequisite for the press to fulfill this role is to ensure that the newspapers deliver content of high quality and that the press is diversified. This is important in order for the newspapers to bring trustworthy and accurate information to all groups of society, and in order to give all the members of society a voice.[52] One of the main goals of the Norwegian media policy is to promote quality and diversity in the national media.[53]

A free and open press is also is an imperative shield against abuses of power and important to ensure that the government represents its people and can be held accountable by its citizens. The press has therefore often been referred to as a watchdog over government. An alert, thorough, and critical press is crucial in all countries to prevent careless and unethical behavior of government officials, crime and corruption, and it is an essential check on both government and businesses to help provide more effective allocation of resources in the public sector. There are several instances where investigative journalism has contributed to the exposure of misuse of power, imprudence, or even illegal behavior among politicians or corporations. In 2001, two journalists from the *Wall Street Journal* uncovered the Enron scandal in the United States. In 2005, three journalists from *Aftenposten* reported that the CEO for two Norwegian public companies, *Nedre Romerrike Vannverk AS* (a pumping station), and *AS Sentralrenseanlegget RA-2* (a sewage treatment plant), had through his son's private company funneled over 100 million NOK from these two public companies into his own private accounts.

The role of newspapers as watchdogs is especially important in a country like Norway, where around 50% of the national product is directed by the public sector and where the state manages the Government Pension Fund – Global (in Norwegian: Statens Pensjonsfond utland), or more commonly known as The Oil Fund, worth more than 3000 billion NOK,[54] and the Government Pension Fund – Norway (in Norwegian: Statens Pensjonsfond innland).

In addition to the political importance of newspapers, newspapers are also important in a social and cultural way. Reading news may be seen as a social glue; sharing and discussing news binds people together. In addition, news reading improves writing and language skills, and is

51 Kind and Møen (2011), p. 4.
52 NOU (2010: 14), p. 18; Carpenter (2010), pp. 1064-1065.
53 NOU (2010: 14), p. 18.
54 "Oljefondet har passert 3000 milliarder kroner", *Aftenposten*, October 12, 2011: http://www.aftenposten.no/okonomi/innland/article3863210.ece#.T2Cd3TEaNm0, accessed March 18, 2012.

therefore important to maintain and strengthen national identity and culture.

Newspapers can play an important role in democracy and be of great social and cultural importance. It can thus be argued that quality journalism provides benefits that go beyond the private benefit of the newspapers, advertisers, and the readers, who are the direct beneficiaries of news production, in the sense that it benefits the society as a whole. We therefore say that journalists and newspapers that supply quality journalism are sources of *positive externalities*.

News production does not only provide positive externalities to the citizens, but also to other newspapers. News content is an information good and is characterized by high fixed costs and low marginal costs, i.e., news content is costly to produce, but cheap to reproduce. When news articles are published, the content is relatively easy to copy or to be used in the (re)production of articles in competing newspapers. In the eyes of the original producer, this provides disincentives for resource-demanding news production (in terms of time, wage and effort) because the producer of the original article does not necessarily reap all the benefits of the news production in terms of the number of unique readers (the number of different people reading an article) and advertising revenues. For the competing newspaper, however, this is beneficial as it can now save time and money on research. This may be beneficial from a social stance, because as competing newspapers cover the same topic with different angles, there is a more diversified representation of the original story.[55]

The Norwegian press subsidies are rationalized to preserve diversity and as a result to protect democracy and freedom of speech, stimulate political and social debate, and to uphold the Norwegian language and culture.[56] However, to justify the use of subsidies from an economic point of view we have to determine whether the market is able to provide the optimal amount of news articles or the optimal level of quality. If not, this may justify the use of subsidies by the Norwegian government to the newspaper industry.

The existence of positive externalities is one of the main reasons why the market may not be able to provide the optimal level of quality journalism. The newspapers do not internalize the social and political benefits of their news production, only the private benefits (i.e., their own profits). The positive impact the newspapers have on democracy can not be capitalized by the newspapers because the benefits of "a more democratic" or more efficient society do not directly accrue to the newspapers. The positive impact the newspapers have on each other when they decide to run a story are not being taken into account because the recipients of the positive externalities do not have to

55 Kind and Møen (2011), p. 3.
56 NOU (2010: 14), chapter 3.

pay for it. Thus, goods that generate positive externalities are often underproduced because the monetary incentives to produce the socially optimal levels of quality are too low.[57] Hence, to encourage a higher production of quality news, the use of press subsidies by the Norwegian government may be justified.

Because of the important role of newspapers, possible measures and policies to help the newspaper industry and maintaining the quality of news are being discussed both in Norway and in the U.S. In 2009, the "Newspaper Revitalization Act of 2009" was introduced in the U.S. congress which would allow some newspapers to be treated as non-profit organizations and therefore be exempted from taxes.[58] However, stronger political intervention in the newspaper industry has little political support in the U.S. as many see this as a threat to the independence of newspapers.[59] In Norway, the Ministry of Culture suggested in 2012 that the subsidy system should be extended to online news providers in order to promote innovation and development of the digital news products in Norway, and to promote diversity in the newspaper industry.[60]

In the following sections I investigate how the digital era has changed the economic foundation of the news industry and how the Internet may negatively affect the incentives for production of high-quality content, especially online, and examine possible consequences of negative changes in quality.

2.5. The impact of Internet

The mass media have undergone tremendous changes after the introduction of the Internet and the rise of broadband usage, especially in the industrial world. Information and content, which was mainly created by professionals and distributed by large media companies, are now created, copied, and disseminated by several actors in the virtual community. The Internet has driven the cost of sharing information down to zero, making it possible for practically anyone with an Internet connection to share thoughts, opinions, videos, and information.

Between 1995 and 2010, the usage of Internet by adults (18+) in the U.S. increased

57 In section 4.4.2, I give the formal economic definition of social optimum, and look at the outcomes in the printed newspaper market and the digital newspaper market in comparison to the social optimum.
58 OECD (2010), p. 69.
59 Kirchhoff (2009), p. 2.
60 "Nett skal bety like mye som papir", *Dagbladet*, March 29, 2012: http://www.dagbladet.no/2012/03/29/kultur/pressestotte/moms/medier/mediestotteutvalget/20894769/, accessed April 11, 2012.

dramatically, from about 15% around 74%, according to the Pew Internet and American Life Project (2010). The same study shows that broadband use at home increased from 5% in 2000 to 60% in 2010. A similar pattern emerged in Norway. From 1997 to 2010, the share of the Norwegian population with access to Internet increased from 13% to 93%, and the share of the population with access to broadband increased from 29% to 84% in the period between 2005 and 2010.[61]

As more people have access to a faster Internet, the consumption patterns of information and entertainment change dramatically, especially among the younger segments of the population. Instead of watching their favorite show on television or buying an album in the local record store, many choose to stream or download TV shows and music from the web instead.

News has become easily available on online news outlets, news aggregators, and blogs, and an increasing share of the population get their news from online outlets instead of from a printed newspaper. In 2001, only 13% of Americans got most of their national and international news from the Internet, while 45% got it from printed newspapers.[62] By 2008, the Internet outdid printed newspapers as the primary source of news, with 40% getting most of their national and international news from the Internet, compared to 35% getting it from printed newspapers. The Annual Internet Survey by the USC Annenberg Center for the Digital Future (2008) showed that around 22% of the readers dropped their subscription on printed newspapers because they could find related content for free online. In 2005/06, 36% of a Norwegian sample stated that the Internet was their most important source for news, compared to 48% stating printed newspapers as the most important news source. In 2010, these numbers were 54% and 39%, respectively.[63]

A great concern for today's newspaper executives is how to compensate for the lost revenues in the printed newspaper market. Online newspapers are becoming increasingly popular, however the digital news outlets are struggling to capitalize on the increased popularity. One reason for this is that the market conditions facing online news providers are very different from the market conditions facing printed newspapers, which may influence the value of advertising spaces and thus the income from advertising on online news outlets. I will turn to these issues in the next sections.

61 MedieNorge and Norsk Mediebarometer 2010.
62 Pew Research Center for the People and the Press (2010).
63 MedieNorge and TNS Gallup.

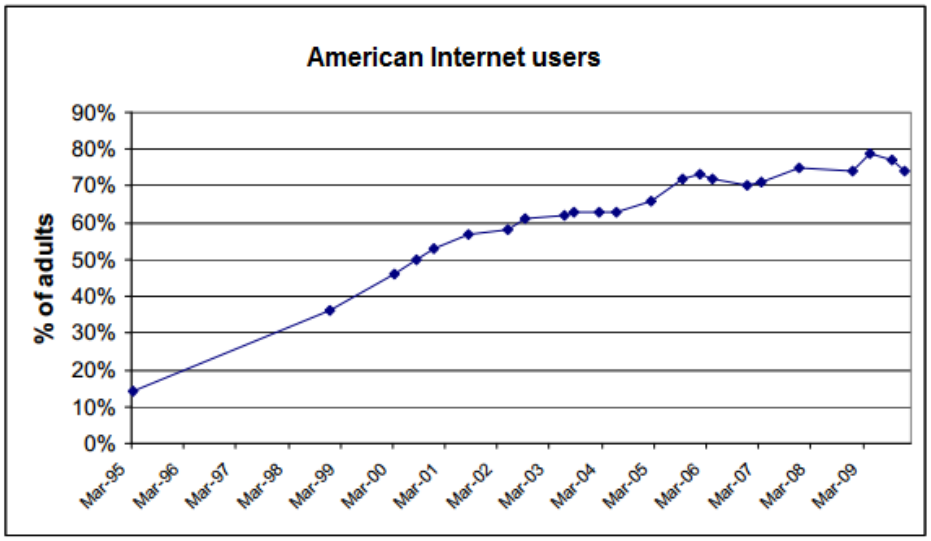

Figure 5: American Internet Usage (Adults) – Percentage
Source: Pew Internet and American Life Project (2010)

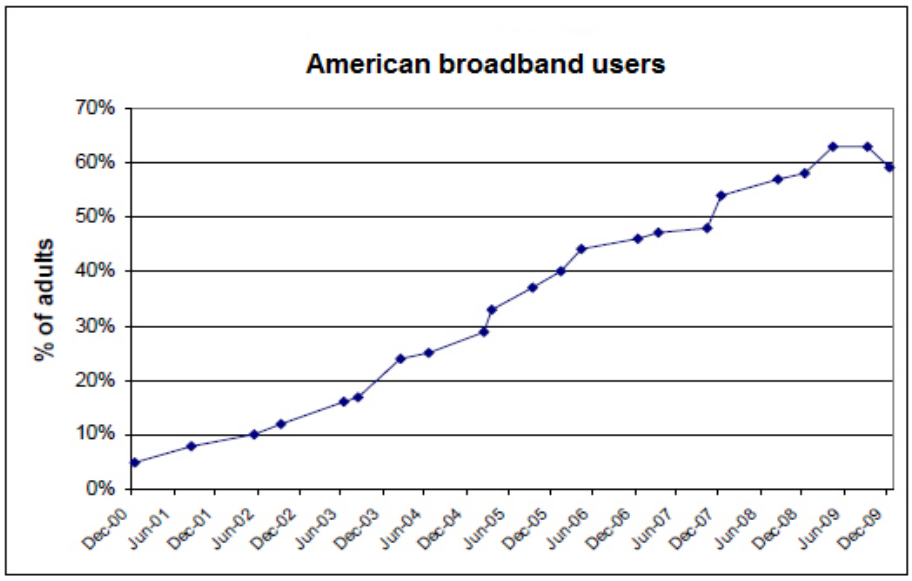

Figure 6: American Broadband Usage (Adults) – Percentage
Source: Pew Internet and American Life Project (2010)

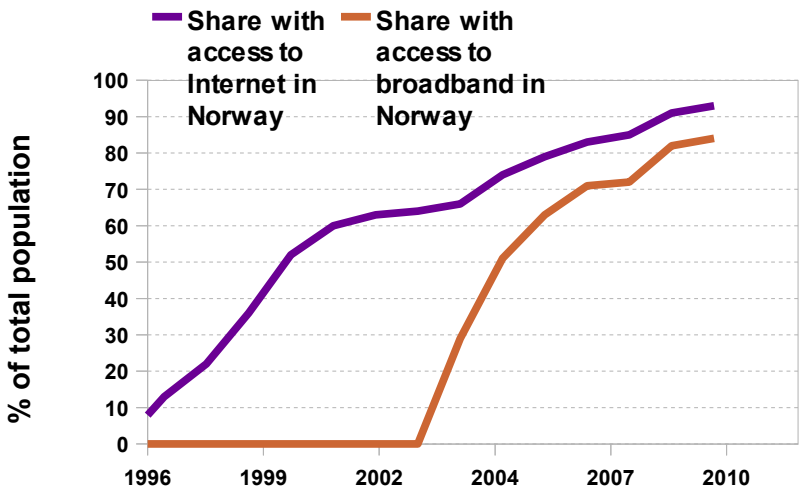

Figure 7: Share of Norwegian population with access to Internet (1997-2009) and share with access to broadband (2004-2009)
Source: MedieNorge and Norsk mediebarometer

2.5.1. Market conditions for online news provision

The business model of online newspapers is not fundamentally different from the business model of its printed counterpart; to attract "eyeballs" and subsequently advertisers. The main distinction between printed newspapers and news offered online is the market conditions the news providers face online compared to in the print market.

First of all, news consumption patterns have changed drastically after the introduction of the Internet. Most printed newspapers are not distributed for free, and most consumers buy a single copy of their favorite printed paper. The readers online have a very different behavior. Because most of the news online is free of charge and the search cost online is low, many consumers visit several news outlets when in search of news, a phenomenon known as *multi-homing*.

Moreover, readers spend far less time reading online news compared to news in a traditional newspapers. In the U.S., for example, online readers spend on average 53 minutes a week reading news on the Internet (around 8 minutes a day), while readers of printed newspapers spend on average 27 minutes a day (57 minutes on Sundays).[64] The behavior of online readers is characterized as more sporadic compared to the behavior of readers of printed newspapers, and reader attention is more scattered online than offline.[65]

64 Kirchhoff (2009), p. 11.
65 OECD (2010), p. 6.

The competition facing the online news providers is very different from the competition facing printed newspapers. Many printed newspapers enjoy regional or local monopolies in the provision of news and information, but when entering the digital world, the same newspapers are faced with competition from a vast number of news outlets, websites, and bloggers.

In addition to fierce competition for readers' attention, the newspapers are also faced with tougher competition on the advertising side of the market. This is especially the case for classified advertisers, who are leaving the newspaper market in favor of cheap and specialized websites such as *Craigslist, Monster* and *Finn*.

2.5.2. Implications for online advertising revenues

In 1970, around 30% of total advertising expenditures went to the newspaper industry.[66] As television and Internet started to enter the market for advertising, these media and outlets have started to eat away at the share of advertising expenditures going to the newspaper industry. Around 2000, the share had dropped to about 20%.[67] Traditionally, the advertisers have "payed" the newspapers in order to access a loyal and stable reader base with the proper demographics. This used to generate high profits for newspapers. The problem for news outlets online is that they are no longer able to guarantee a large and loyal reader base to the same degree as in the printed market. When the consumers are multi-homing online and the reader attention is scattered and limited, online news outlets do not appeal to the advertisers in the same way as printed newspapers. In addition, most major web browsers offer pop-up blockers and ad-filtering, giving more power to the readers and making advertising online even less attractive. According to a press release by the Internet marketing research company *comScore*, 31% of display ads are never seen by the users.[68] These factors affects the prices news outlets online are able to set for their advertising spaces.

Newspapers have become extremely popular in the digital age, but due to the difficult market conditions facing online news sites, they find it hard to capitalize on the increased popularity online. According to *comScore*, American newspaper websites attracted 66.6 million unique visitors (the number of different people visiting a website) in April 2008, compared to 86.4 million print readers

66 Picard (2002), p. 9.
67 Ibid., p. 9.
68 "comScore Introduces Validated Campaign Essentials (vCE), a Holistic Measurement Solution That Validates Advertising Impressions and Audiences Reached with Digital Advertising Campaigns", *comScore,* January 18, 2012: http://www.comscore.com/Press_Events/Press_Releases/2012/1/comScore_Introduces_Validated_Campaign_Essentials, accessed February 28, 2012.

the same month.[69] However less than 10% of newspaper revenues were generated online,[70] even though the share seems to be increasing both in the U.S. and in Norway.[71]

In section 2.4.1, I mentioned that readers spend less time reading news online compared to traditional newspapers. *Figure 8* shows estimates of the average time spent for some selected websites in Norway and the U.S. The figure may in part help explaining why online advertising has proved less profitable for online newspapers compared to other advertising dependent online companies such as *Google* and *Facebook*. According to numbers from the Newspaper Association of America (NAA), total online newspaper revenues in 2011 were around 3.2 billion USD. The same year *Google* earned 36.5 billion USD while *Facebook* earned about the same as the total online revenues of all the members of the NAA.[72] When the average user spends limited time on online news sites and have few pageviews within the site (e.g. article "clicks"), the likelihood of being "impressed" by advertising is likely to be much lower than what is the case for the average *Facebook* user, who spends much more time on the *Facebook* website.

The economic foundation for the newspaper industry and news production has fundamentally changed in wake of the digital era. In the printed market, the change is caused by the migration of readers to digital platforms. Newspaper companies have gone from a period of (mostly) continued growth to a time of falling readership, circulation, and advertising revenues. The problem online is that the news companies are struggling to capitalize on digital news because advertising has proved to be less effective online.

69 "As Print Newspapers Decline, How Does Digital Fill the Void?", *comScore*, July 23, 2009: http://blog.comscore.com/2009/07/print_newspapers_decline.html, accessed March 21, 2012.
70 Kirchhoff (2009), p. 1.
71 Pew Research Center's Project for Excellence in Journalism (2012); Høst (2011), p. 5.
72 "Google 2012 Financial Tables", *Google Investor Relations*: http://investor.google.com/financial/tables.html, accessed April 15, 2012; "United States Securities and Exchange Commission (SEC), Registration Statement, Facebook, Inc", *United States Securities and Exchange Commission*: http://www.sec.gov/Archives/edgar/data/1326801/000119312512034517/d287954ds1.htm, accessed March 21, 2012.

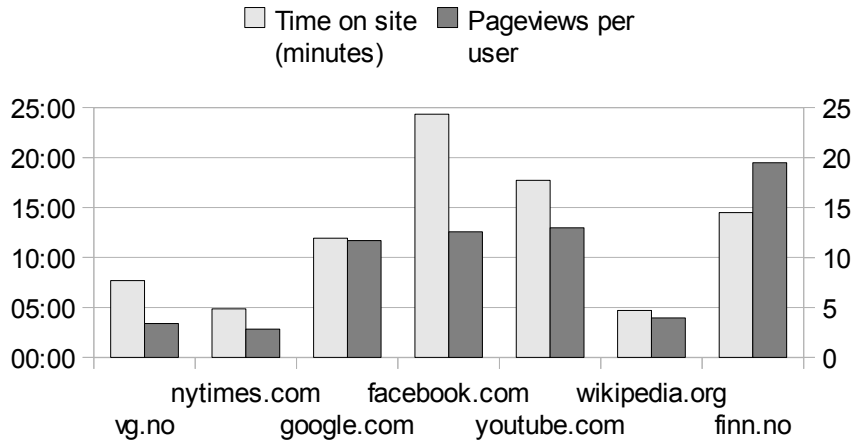

Figure 8: Average time spent on site (in minutes) and the number of pageviews per user for some selected web sites
Source: Alexa: The Web Information Company

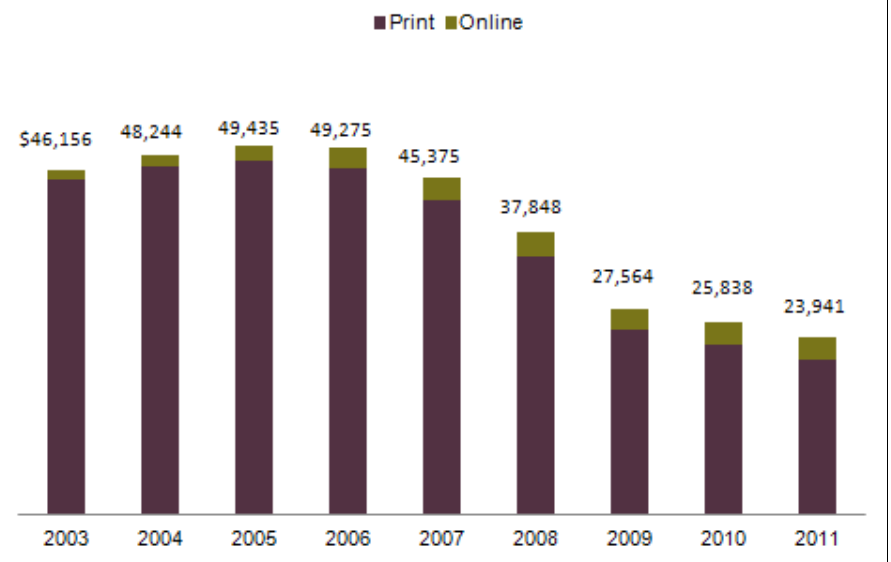

Figure 9: Composition of advertising revenues from printed newspapers and online newspapers in the United States (in millions)
Source: Pew Research Center's Project for Excellence in Journalism (2012)

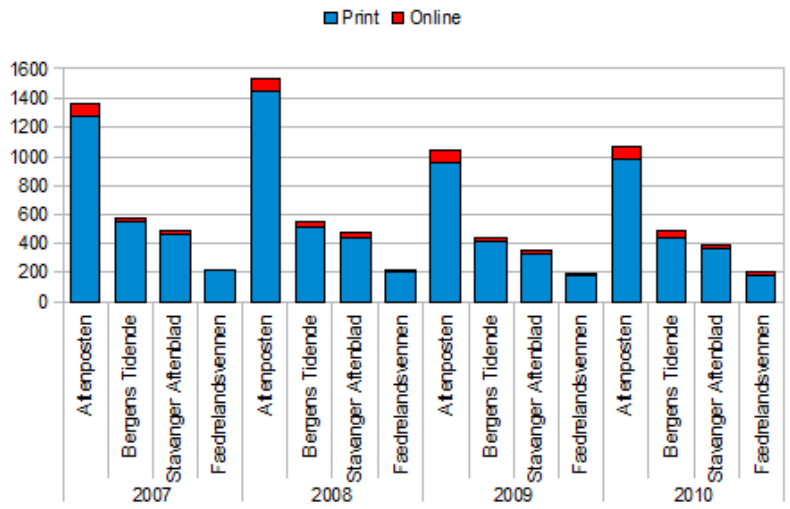

Figure 10: Composition of offline and online revenues for four major newspaper companies in Norway (in millions NOK),
Source: Media Norge (M:NO)

2.5.3. Consequences for quality

One of the most pressing concerns for the industry is that the revenues made on the digital news outlets are not enough to support the existing size and quality standards of the industry, and that the difficulties of the industry poses a threat to the newspapers' traditional roles as a reliable information source and as a check on businesses and government officials, especially online. The need for immediacy and the constant pressure for profitability may have adverse effects on the level of quality on the news supplied online. In the printed market, quality may be affected through lower revenues and cutbacks in staff. In 2010, 16% of U.S. newspaper executives responded that their staff "is too small to do more than the minimum level of reporting".[73]

The importance of conserving "quality journalism" is highly connected with the special role journalism has in society, which I discussed in section 2.4. The digital era are posing threats to several industries, including the movie and music industry, but the vital role of newspapers and journalists makes journalism different from other media content, and the future of the newspaper industry in the wake of the digital revolution has become a public matter in several countries. In 2009, President Obama expressed concerns over the distressed newspaper industry and the

73 Pew Research Center's Project for Excellence in Journalism (2010).

consequences for quality journalism: "*I am concerned that if the direction of the news is all blogosphere, all opinions, with no serious fact-checking, no serious attempts to put stories in context, that what you will end getting is people shouting at each other across the void but not a lot of mutual understanding*.".[74]

The tougher market conditions facing online news sites are by many seen as harmful for the quality of the news content supplied online, and it seems as though many people find that the quality of printed newspapers exceed the quality of its online counterpart. According to a survey conducted by the Pew Research Center's Project for Excellence in Journalism (2009), printed newspapers are perceived as more credible news sources compared to digital news outlets by the U.S. public. The survey from 2010 shows that 57% news executives believe that the Internet are changing the fundamental values of journalism rather than transferring those values online and 51% believe that journalism is heading in the "wrong direction". One of their biggest concerns is loosening standards on accuracy and verification. The same picture emerges in Norway. According to Ottosen and Krumsvik (2010), 17% (on average) of the readers perceived the online newspaper edition inferior to the printed edition and 56% of the journalists in the survey had the same opinion.

Particularly the new competition facing newspapers from blogs and news aggregators generated by the birth of the Internet have been blamed for the hardships of the industry. Some newspaper editors have argued that bloggers and news aggregators are "stealing" content from newspapers and that they unfairly reap some of the advertising profits that should have gone to the news outlets.[75] The managing editor of the *Wall Street Journal*, Robert Thomson, said in an 2009 interview with *The Australian* that "*There is a collective consciousness among content creators that they are bearing the costs and that others are reaping some of the revenues.*.". He continued by stating that "*There is no doubt that certain websites are best described as parasites or tech tapeworms in the intestines of the Internet...*".[76]

As mentioned in section 2.4, there is a high degree of consensus that quality news needs to be of social, political or cultural significance, and that the higher ratio of self-produced content to purchased material, the higher ratio of editorial material to advertising, the use of multiple sources,

74 "Obama concerned about newspapers", *Pittsburgh Post-Gazette*, September 20, 2012: http://old.post-gazette.com/pg/09263/999253-482.stm, accessed March 23, 2012.

75 "Google may lose WSJ, other News Corp. sites", *CNET,* November 9, 2009: http://news.cnet.com/8301-31001_3-10393209-261.html, accessed February 25, 2012.

76 "Google dubbed internet parasite by WSJ editor", *The Australian*, April 6, 2009: http://www.theaustralian.com.au/media/google-dubbed-internet-parasite/story-e6frg996-1225696931547, accessed February 25, 2012.

and coverage of local news are important factors in quality journalism. Of course, the utilization of these criteria in the making of news content depends heavily on the people that are creating the newspaper content, i.e., the *journalists*. Naturally, quality is heavily dependent on journalists and the environment that they work in. The environment that online journalists work in is very different from the environment that "traditional" journalists work in. This is naturally connected to the market conditions that the newspaper companies are facing online.

As mentioned earlier, the competition for readers' "eyeballs" is tough online. Readers switch between different outlets and/or combine them, and the need to catch readers' attention in order to haul in more ad dollars places a high pressure on online journalists to continuously produce new and "fresh" material that does not come off as "old news" in the eyes of the readers. The fresher the content, the more likely it is that the content has not been read before on another online outlet, and the more likely it is that the newspapers are able to capitalize of the content in terms of "clicks" and hence ad dollars.[77] Because material online is easy to "snatch" by online competitors, online journalists have a higher pressure on them to produce a high quantity of news articles compared to journalists working in the print sector. The increased pressure of productivity and immediacy online may be one of the reasons why news content online is perceived as inferior to content offered in printed newspapers. The expectations of delivering a high quantity of news content put a heavy time pressure on the journalists that may hurt the quality of the content they produce.

Media observers have noticed that several of the journalistic ideals and fundamental values of journalism such as covering a diversity of topics, use of multiple sources, and self-production, have come under pressure in the Internet age.[78] The need for immediacy in online reporting may come at the price of a lower degree of accuracy as journalists online may be more focused on "getting the news out" before checking its accuracy. Tightly connected to this is the use of multiple sources. As the journalists face a greater time pressure due to the expectation of high productivity, journalists may choose to include and inquire less sources in order to increase the amount of articles produced in the course of a day. According to Ottosen and Krumsvik (2010), 75% of the respondents in their research project stated that they use fewer sources than they want to use,[79] and 73% believe that the requirement for high quantity weakens the quality of the editorial material.

In January 2011, the need for immediacy became clear when *Agderposten* posted a news

77 Many newspapers have a performance-based pricing on advertising online; the advertisers pay per view or "hits". Hence, the newspaper gets payed each time the article is viewed (CPI), or per thousand views (CPM).
78 Ottosen and Krumsvik (2010), p. 22.
79 The respondents consisted of mostly journalists.

article online that was false, but that was picked up by several large newspapers such as *Aftenposten* and *VG*, which had not verified the facts stated by the originator.[80]

Another noticeable trend online is the increase of copy-paste journalism.[81] It can be argued that it is easier to generate page views online *without* investing in journalism.[82] Of the top-20 online news sources in 2011, seven were either pure aggregators or hybrids.[83] Quality content is often costly to produce. A newspaper may work up a story that may take weeks to research and write, however, as it is published online, it may or may not end up as a top link in the search engine results (the links that are listed at the top of the search engine results receive the most hits, and therefore more advertising revenues). At the same time, other sites may summarize, link, copy, or comment on the original reporting and generate page views and advertising revenues. Because information is time-sensitive, immediate copying of the originators content may constitute *free-riding*. The originator bears the costs of news production while the "copycat" can reap some of the benefits in form of advertising revenues of the news production that should have gone to the originator because the news offered by the copycat directly competes with the news offered by the originator. Hence, the incentives to invest in original reporting diminishes as the competition from other news outlets, news aggregators, and blogs increases, as it becomes more difficult for the news companies to capture enough ad dollars to fund the creation of original material.

The problem with the increased trend of copying others' material instead of self-producing is that news content online becomes homogenous and indistinctive, which hurts diversity in the representation of issues, opinions, and ideas. As more newspapers online use the same wire services, the differentiation between the different newspaper companies becomes smaller, which may hurt diversity in both content and opinions. In a study conducted by Paterson (2006) it was found that when it comes to international news online, almost all the original reporting comes from a handful of news agencies (*Reuters, AP, AFP* and *BBC*), while some newspapers do a little international reporting themselves (*CNN, MSN, New York Times, Guardian* and a few other large newspapers), while most newspapers do no original reporting on international news. A preliminary report by the university college in Volda (in Norwegian: Høyskolen i Volda) to Mediestøtteutvalget (media

80 "Feilaktig Amelie-sak gikk landet rundt", *Journalisten.no*, January 19, 2011: http://www.journalisten.no/story/63747, accessed March 23, 2012.

81 Steensen (2009), p. 13. There are several ways to "copy" news. Examples are (free) illegal copying that violates the "fair use rule" (e.g. by copying an whole article), or to take the story and rewriting it to give it another spin, or by obtaining the right to post an article made by another outlet by paying a syndication fee.

82 Federal Communications Commission (2011), p. 130.

83 Ibid., p. 130. A news aggregation site is a site that draws viewers by summarizing news covered by news outlets and posting links to content on other sites. A hybrid is a site which combine aggregation and original reporting.

support committee), which was appointed by the Norwegian government, showed that online news sites have a higher number of articles posted on the websites compared to its offline counterparts, and that one of the reasons for this can be attributed to "recycling" of news, and short citations of news agency content and other online news sites.[84]

The media and the newspapers have a huge influence on which issues that receive attention from both the public and governments, and the media has the ability to create publicity around causes they perceive as important. A worry in face of the increased use of wire services and "copy-paste journalism" is that online news reporting will be characterized by a few powerful news agencies and newspaper companies dictating the political and social agenda.

Media observers and scholars are also noticing a trend among editors to skew their content towards commercial ends, instead of maintaining the newspapers' more idealistic roles in democracy.[85] Because newspapers are highly dependent on revenues from advertising online, news sites are increasingly shifting their editorial material away from small-reach news, to more mass appealing or eye-catching material such as titles about sex, celebrities, crime, scandals or national and international news, in order to increase their advertising revenues by attracting more viewers or "hits".[86] This shift may compromise the newspapers' role as a reliable and trustworthy information source, and hurt the diversity of media as some topics might only get minimum coverage or no coverage at all.

Of course the supply of quality content may also depend on the profitability of the newspaper or news outlet, and not merely on the market conditions facing news providers. The production of quality content requires dedication of time and money as it often entails traveling, information gathering and interviewing of news sources. As the newspaper industry is experiencing lower profitability and layoffs of journalists, the newspaper companies can no longer afford to maintain the same standards of the content they deliver as they must cut down on the production costs. Hence, it is likely that the lower the profitability of the newspapers, the harder it becomes for the journalists and news providers to fulfill their roles as a "watchdog" and an accurate and trustworthy information source in a satisfactory way. In this regard, the Norwegian press subsidies may have acted as a "buffer" for the newspaper industry when the Internet was introduced because the government support to some extent alleviate the newspaper companies' concern for profit-making by

84 NOU (2010: 14), p. 61.
85 Picard (2004), p. 55.
86 Patterson (2000), p. 6; Baum (2002), p. 92; Ottosen and Krumsvik (2010), p. 22.

making the companies less dependent on advertising revenues compared to the U.S. companies. In addition, there seems to be a strong tradition in Norway to read printed newspapers and so printed newspapers are in a stronger position in Norway compared to the U.S. For these reasons, the effect on quality of the Internet may be less severe in Norway compared to in the U.S.

3. A theoretical model

In order to given an economic analysis of the impact of Internet on the quality of newspaper content, I apply a model by Armstrong and Weeds (2007) which originally is used to compare pay-TV and advertising funded TV, where quality programs are assumed costly to produce. The more it costs, the higher the quality is. I choose to interpret the model in light of the newspaper industry and investigate how profits and quality may differ between non-free newspapers (printed) and free newspapers (online).

In the next section I will introduce the main assumptions in the model and the basic model set up. In section 3.2, I look at the equilibrium outcomes when the newspapers are priced (non-free). The equilibrium outcomes when newspapers are free, are derived in section 3.3. I will compare the outcomes in the two funding regimes to the social optimum in section 3.4. In section 3.5, I will look at the effect on the equilibrium outcomes in the two funding regimes when there is more competition.

3.1. Model set up

We assume that there are two newspaper companies, A and B, each offering one newspaper to the readers. Further assume that there is an exogenous level of differentiation between the two newspapers, meaning that the readers do not rank the newspapers equally. Given a price, some prefer the newspaper owned by company A, while others prefer the newspaper owned by company B.[87]

The companies offer the readers utility, u_i, where i = A, B, which is identical for each reader. The individual preferences of the readers are captured by introducing a stochastic variable ω, which we assume is uniformly distributed between $-t$ and t; $\omega \sim U[-t\ ,\ t]$. The larger the t, the more heterogeneous is the readers' preferences. Moreover, $\omega > 0$ (< 0) represents preferences in favor of newspaper A (newspaper B).

This is a Hotelling's model of spatial competition where the newspapers are horizontally differentiated. You can imagine that the readers are uniformly distributed along a line segment that stretches between $-t$ and t, with the newspapers located at the two endpoints, as illustrated in *figure*

87 I will from now and on refer to the newspaper owned by company A as newspaper A and the newspaper owned by company B as newspaper B.

11.

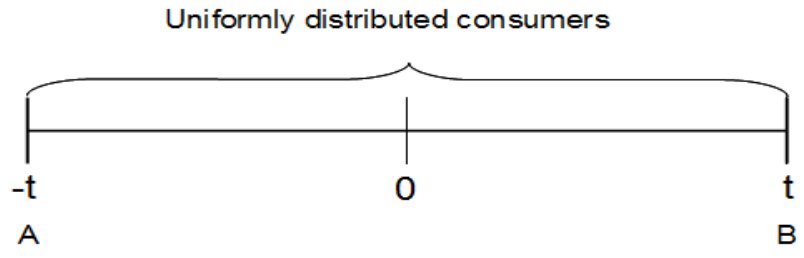

Figure 11: Distribution of readers and location of the newspapers

The *t* is often interpreted as the degree of differentiation between the newspapers. When *t* is small, the differentiation between the two newspapers is small, and when *t* is high, the differentiation between the two newspapers is large. Alternatively, *t* can be interpreted as the newspaper companies' market power. If there is little differentiation between the newspapers, the utilities the newspapers offer are highly critical for the readers' choices, and if there is high differentiation, the decisions of the readers will depend more on each of the readers' personal preferences. A reader that is indifferent between the two newspapers is located at 0, and will choose solely based on the utilities offered by the two newspapers.

A reader will choose newspaper A if the sum of the utility and the personal preference for newspaper A is higher than the utility obtained from choosing newspaper B:

(3.1) $\omega + u_A - u_B > 0$

We see that the higher the ω, the more probable it is for this to hold.

The market share of the company that distributes newspaper A, s_A, is the probability that (3.1) is true:

(3.2) $s_A = Pr(\omega + u_A - u_B > 0) \Leftrightarrow Pr(\omega > -(u_A - u_B)) \Leftrightarrow Pr(\omega < u_A - u_B)$

where the last expression comes from the symmetry of the uniform distribution around the zero mean. Newspaper A's market share is illustrated in *figure 12*.

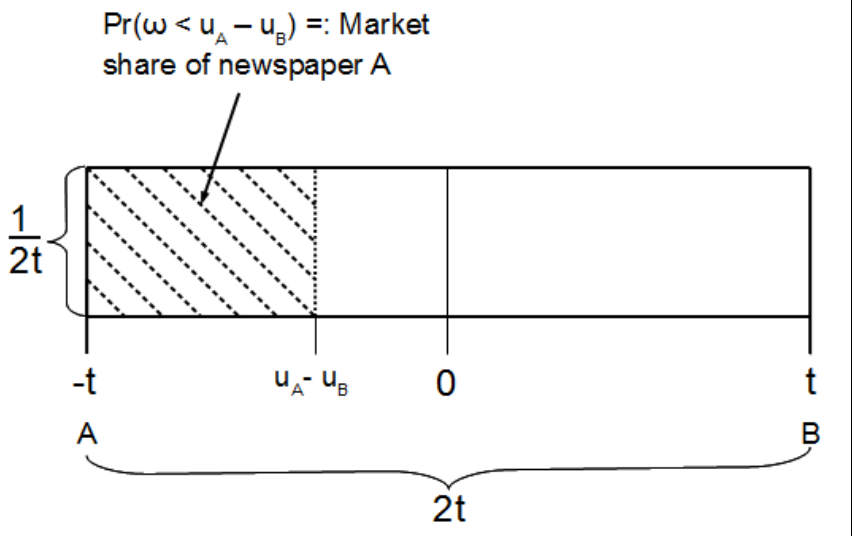

Figure 12: Market share of newspaper A

Calculation of the shaded area in *figure 12* gives us the expression for the market share of newspaper A

(3.3) $$s_A = [u_A - u_B - (-t)] * \frac{1}{2t} = \frac{t + u_A - u_B}{2t} = \frac{1}{2} + \frac{u_A - u_B}{2t}$$

The market share of newspaper B is then the remaining area; $s_B = 1 - s_A = \frac{1}{2} + \frac{u_B - u_A}{2t}$.

We assume that the readers' utility of newspaper *i* depends on three variables:

(3.4) $$u_i = v_i - \delta n_i - p_i \quad , i = \text{A, B}$$

where v_i is the (endogenous) quality of the newspaper content, n_i is the number of ads in the newspaper, δ is the degree of perceived nuisance of the ads to the readers[88], and p_i is the price on the newspaper (if there is a price). As seen from (3.4), the utility of the reader is increasing in content quality and decreasing in advertisements and price.

We further assume that the advertising revenues that accrue to the newspaper companies are

88 Many have argued that newspaper ad nuisance to the readers is low, or that it can even be positive. See e.g. Rysman (2009) and Anderson and Gabszewicz (2005). Advertisement is in many cases clearly a nuisance to television watchers, as the TV-commercials interrupts and disturbs the program the viewer is watching. However this may not be case for newspaper readers as they may just skip the advertisement or even find some of them enjoying and helpful (especially classifieds).

increasing in the readership of their newspapers. That is, for an advertising level, n_i, newspaper company *i* receives $R(n_i)$ in advertising revenues *per reader,* where we assume that $R(\bullet)$ is a concave function, and that this function is equal for both newspaper companies. The assumption about concavity of the advertising revenue function comes from the presumption that ads are more valuable to the advertisers when there are fewer ads in total; the chance that the reader is impressed by the advertisement is higher when there are fewer ads compared to when there are many ads and each ad is likely to get less attention from the readers.

Suppose that the only cost of the newspaper company is related to the quality of the newspaper's content and that the cost does not depend on the number of readers

$$c(v_i)=\frac{\gamma v_i^2}{2} \tag{3.5}$$

The cost function is assumed to be equal for the two companies (γ is the same).

We can now express the profit function for newspaper *i* as

$$\pi_i=s_i p_i+s_i R(n_i)-\frac{\gamma v_i^2}{2} \tag{3.6}$$

where the first term is total revenues from newspaper sales and the second term is total advertising revenues.

By inserting (3.4) in the market shares, and by inserting this in (3.6), we can express the profit function as

$$\pi_i=[\frac{1}{2}+\frac{v_i-\delta n_i-p_i-(v_j-\delta n_j-p_j)}{2t}](p_i+R(n_i))-\frac{\gamma v_i^2}{2} \tag{3.7}$$

where v_j denotes the rival's newspaper quality, n_j denotes the rival's level of advertising, and p_j is the rival's newspaper price or subscription fee (e.g. if i = A, then j = B).

In the following sections I will derive the equilibrium levels of advertising and quality in two different funding regimes. I will start with the case where we assume that the newspapers are funded with both advertising revenues and revenues from single-copy sales or subscription fees, which I interpret as the case of printed newspapers.

3.2. Case 1: Mixed funding regime

We use the framework presented above to look at the equilibrium outcomes in the case where the newspaper companies can charge the readers for their newspapers. As mentioned, most printed newspapers have a large market share in their respective market, so the duopoly framework is fitting.[89]

The newspaper companies have three choice variables, and we assume that the companies' choices are made simultaneously. They need to decide on the price on the paper, the advertising level in the newspaper, and the quality of their content. Let us start by looking at the optimal choices of advertising levels in the two newspapers. By solving for the p_i in (3.4) and inserting it in (3.7), we get the following expression of newspaper *i's* profit as a function of utilities and advertising levels:

$$\pi_i = [\frac{1}{2} + \frac{u_i - u_j}{2t}](v_i - u_i + R(n_i) - \delta n_i) - \frac{\gamma v_i^2}{2} \quad (3.8)$$

To ensure a market sharing equilibrium, meaning that both newspaper companies have positive profits, we assume that

$$\gamma \geq \frac{1}{4t} \quad (3.9)$$

By deriving the first order condition of (3.8) with respect to n_i, we find the condition for the equilibrium level of advertising

$$R'(n_i) = \delta \quad (3.10)$$

The equilibrium level of quality, v_i, is found in a similar manner

$$v_i = \frac{s_i}{\gamma} \quad (3.11)$$

The first order condition with respect to p_i is

89 This assumption is of course much weaker when we look at newspapers online because of the numerous competitors in the digital sphere.

(3.12) $$\frac{t+p_j-p_i+K}{2t}-\frac{(p_i+R(n_i))}{2t} = 0$$

where $K = (v_i - v_j) + \delta(n_j - n_i)$. By solving for p_i, we find the best response function of newspaper i, BR_i, or the choice of p_i that maximizes newspaper i's profit, given *any* price choice of the rival newspaper j:

(3.13) $$p_i=\frac{t+(v_i-v_j)+\delta(n_j-n_i)-R(n_i)}{2}+\frac{p_j}{2}$$

Because of symmetry, we find the best response function of newspaper j to be:

(3.14) $$p_j=\frac{t+(v_j-v_i)+\delta(n_i-n_j)-R(n_j)}{2}+\frac{p_i}{2}$$

We see that the best response functions are increasing in the rival's price, meaning that the prices are strategic complements; if one of the newspapers increases its price, then the optimal strategy of the rival is to also increase its price (by one half).

Because the newspapers are identical in the sense that they have the same advertising revenue function and cost function, and we only consider symmetric equilibria, this must imply that the newspapers will make the exact same choices regarding advertising levels and quality, and that the optimal levels of these variables therefore must be the same for both newspapers. This means that $v_i = v_j = v$, $n_i = n_j = n$, and $R(n_i) = R(n_j)$. The equilibrium newspaper prices are found by inserting the best response functions into one another and solving for the prices. This gives us the following equilibrium prices

(3.15) $$p_i=t-R(n_i)$$

(3.16) $$p_j=t-R(n_j)$$

Because $n_i = n_j = n$, this means that the newspapers will set the same price. It comes as no surprise that the prices are increasing in t; the more market power the newspapers have, the higher prices they are able to set (without losing all its readers). The equilibrium price is such that, given the price

choice of your rival, you would not change your own price (i.e. a Nash equilibrium). Hence, the equilibrium is characterized by the intersection of the two newspapers' best response functions. This is illustrated in *figure 13*.

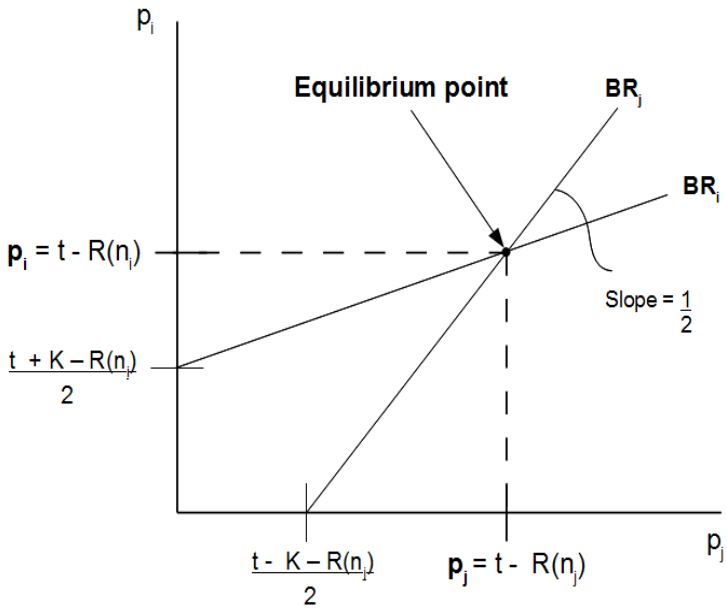

Figure 13: Illustration of equilibrium point, best response functions, and equilibrium prices

To ensure that the prices are positive, we assume that in equilibrium n is such that $t > R(n)$ holds.

The symmetric equilibrium also means that the newspapers get half of the market of readers each (this is easily seen from (3.4) as the utilities the newspapers offer will be the same).

We have identified the *symmetric* equilibrium outcomes of three variables in case 1, where the newspapers are funded by both single-copy sales and advertising revenues:

(3.17) $R'(n_1)=\delta$

(3.18) $v_1=\frac{1}{2\gamma}$

(3.19) $p_1=t-R(n_1)$

Newspaper profit, given the equilibrium price, market share and content quality, is then

$$(3.20)\quad \pi_1 = s_1(p_2 + R(n_1)) - \frac{\gamma v_1^2}{2} = \frac{1}{2}[t - R(n_i) + R(n_i)] - \frac{\gamma}{2}\left[\frac{1}{2\gamma}\right]^2 = \frac{1}{2}t - \frac{1}{8\gamma}$$

where the profit is increasing in t and decreasing in the cost variable, γ.

Industry profit is then easily calculated as

$$(3.21)\quad \Pi^{industry} = \frac{1}{2}t + \frac{1}{2}t - 2\frac{1}{8\gamma} = t - \frac{1}{4\gamma}$$

In this case, industry profits are explained only by the level of differentiation and the cost of quality.

3.3. Case 2: Advertising funding regime

In this section we will characterize the equilibrium outcomes when the newspaper companies do not charge their readers. This could for instance represent online newspapers, as these in most cases are free of charge.[90]

We stick to the framework presented in section 3.1, except that $p_i = 0$. As in section 3.2., the equilibrium outcomes will be symmetric. With $p_i = 0$, the newspaper profit function becomes

$$(3.22)\quad \pi_i = \left[\frac{1}{2} + \frac{u_i - u_j}{2t}\right] R(n_i) - \frac{\gamma v_i^2}{2}$$

where $u_i = v_i - \delta n_i$.

The newspaper must choose the optimal level of advertisement and the quality of their online content. We write out the expression for profit:

$$(3.23)\quad \pi_i = \left[\frac{t + v_i - \delta n_i - (v_j - \delta n_j)}{2t}\right] R(n_i) - \frac{\gamma v_i^2}{2}$$

The equilibrium ad level must fulfill the first order condition of (3.23) with respect to n_i:

$$(3.24)\quad \frac{\partial \pi_i}{\partial n_i} = 0 \;\Leftrightarrow\; \left[\frac{t + (v_i - v_j) + \delta(n_j - n_i)}{2t}\right] R'(n_i) - \frac{\delta R(n_i)}{2t} = 0$$

90 Of course, the duopoly framework does not fit very well with the competitive environment of digital news sites. In section 6.5, we look at the outcome when competition toughens.

As before, $v_i = v_j = v$, and $n_i = n_j = n$. The symmetric equilibrium ad level in case 2, n_2, must therefore fulfill the following expression

$$(3.25) \quad \frac{R'(n_2)}{R(n_2)} = \frac{\delta}{t}$$

The equilibrium level of quality must fulfill the following first order condition

$$(3.26) \quad \frac{\partial \pi_i}{\partial v_i} = 0 \Leftrightarrow \frac{R(n_i)}{2t} - \gamma v_i = 0$$

The symmetric equilibrium level of content quality on online news outlets, v_2, is therefore given by:

$$(3.27) \quad v_2 = \frac{R(n_2)}{2t\gamma}$$

Because $u_i = u_j = u$, the market share for each of the newspapers is still one half.

Profit in equilibrium in the case of online news outlets is then

$$(3.28) \quad \pi_2 = \frac{1}{2}R(n_2) - \frac{1}{2}\gamma v_2^2 = \frac{1}{2}R(n_2) - \frac{\gamma}{2}\left(\frac{R(n_2)}{2t\gamma}\right)^2 = \frac{1}{2}R(n_2) - \frac{R(n_2)^2}{8\gamma t^2}$$

The break-even condition for the newspapers, or the condition to ensure a market sharing equilibrium, is satisfied if

$$(3.29) \quad \frac{1}{2}R(n_2) - \frac{R(n_2)^2}{8\gamma t^2} > 0 \Leftrightarrow 4\gamma t^2 > R(n_2) \Leftrightarrow 4\gamma t > \frac{R(n_2)}{t}$$

Industry profit is then

$$(3.30) \quad 2 * \pi_2 = R(n_2) - \frac{R(n_2)^2}{4\gamma t^2} = R(n_2)\left[1 - \frac{R(n_2)}{4\gamma t^2}\right]$$

which in this case also dependens on the *R(●)* function.

3.4. Regime comparison

3.4.1. Quality and advertising levels

We want to compare the equilibrium outcomes in the two funding regimes. First of all, the level of advertisement will be lower in a printed paper compared to on an online news site. To make (3.17) and (3.25) comparable, we divide (3.17) by $R(n_1)$:

$$(3.17') \quad \frac{R'(n_1)}{R(n_1)} = \frac{\delta}{R(n_1)}$$

We assumed in section 3.2. that $t > R(n_1)$. This means that

$$(3.31) \quad \frac{R'(n_1)}{R(n_1)} = \frac{\delta}{R(n_1)} > \frac{\delta}{t} = \frac{R'(n_2)}{R(n_2)} \Leftrightarrow \frac{R'(n_1)}{R(n_1)} > \frac{R'(n_2)}{R(n_2)}$$

Because $R(\bullet)$ is a concave function, this must imply that n_1 has to be less than n_2.

These results also demonstrates that $t > R(n_2)$. Because $n_2 > n_1$, it follows that $R'(n_2) < R'(n_1) = \delta$. From (3.25) we can deduce that, because $R'(n_2) < \delta$, t must be larger than $R(n_2)$ for (3.25) to hold.

Because we have determined that $t > R(n_2)$, this means that the right hand side of the last expression in (3.29) is less than 1. Hence, a sufficient condition for positive profits under the advertising funding regime is that $4\gamma t > 1$, which is the same condition for newspapers to break-even in the printed market. This implies that as long as it is profitable with printed newspapers, it will also be profitable with online newspapers.

When going from a mixed funding regime to a regime where the paper is purely funded by advertising, quality will decrease. This follows from the assumption that $t > R(n_2)$:

$$(3.32) \quad R(n_2) < t \Rightarrow \frac{R(n_2)}{t} < 1 \Rightarrow v_2 = \frac{R(n_2)}{2t\gamma} < \frac{1}{2\gamma} = v_1$$

We have characterized two main differences between the two funding regimes. The fact that advertising levels are higher when the newspapers are funded only by advertising should not come as a surprise. The higher quality level in paid papers is a consequence of the fact that when the

newspaper companies are able to charge for their papers, they are able to extract some of the readers' surplus by raising the price on their paper following an increase in quality. This is because the readers' willingness to pay for the paper increases in quality.

3.4.2. Social optimum

I will now compare the level of quality and advertising in the two funding regimes to the socially optimal levels of these variables. Social efficiency refers to the optimal distribution of resources in a society, or the optimal output of a good, taking into account all external costs and benefits, as well as internal costs and benefits. It's a situation where the marginal social benefit (**MSB**) is equal to the marginal social cost (**MSC**)**.**

The social benefit is the sum of two benefits; the benefit to the agent who is performing the action (which in this case is the newspapers), and the benefit accruing from the production to a different party than the one that is producing the product (which in this case is the readers). Because the advertisers' utility or profit function is not included in this theoretical model, we can not determine the effect on the utilities or profits of the advertisers of news production.

The social cost is defined in a similar matter. It's the sum of two costs; the cost of the agent who is performing the action (newspapers), and the cost imposed on a different party than the one that is performing the action (readers).

Let's start by finding the socially optimal level of content quality. We want to find the quality level that maximizes social benefit minus social cost:

$$(3.33) \quad max_v \; v - \frac{1}{2}\gamma v^2 - \frac{1}{2}\gamma v^2 \;\Leftrightarrow\; v = \frac{1}{2\gamma}$$

This result shows us that the quality provision under the mixed funding regime is equal to the social optimal level of quality, and that the quality provision under the advertising funding regime is too low (because $v_2 < v_1$) seen from a social stance. This means that when newspapers are funded both from advertising and single-copy sales, the social and private incentives to provide quality coincide.

We do the same for advertising levels. We want to find the advertising level that maximizes

(3.34) $max_{n_i, n_j} \; R(n_i) + R(n_j) - \delta n_i - \delta n_j \;\Leftrightarrow\; R'(n_i) = \delta \;\text{ and }\; R(n_j) = \delta$

Again we see that under the mixed funding regime, advertising levels coincide with the advertising levels that are socially optimal, and that the advertising levels under the advertising funding regime are too high (because $n_2 > n_1$).

3.4.3. Reader surplus

From a social stance the mixed funding regime is preferable as the equilibrium outcomes coincide with the social optimum. However, the social optimum may not be preferred by the readers. The readers prefer high quality, low advertising levels, and *low prices*. When the two funding regimes are different, in the sense that $t > R(n_1)$, and quality is fixed, Armstrong and Weeds (2007) show that the utility of the free newspaper will always be higher than the utility of the paid newspaper. This means that the *disutility* of more advertisement in the free paper is outweighed by the utility increase you get from the fact that you do not have to pay for the news.

When quality is endogenous, on the other hand, these preferences might switch. This can be shown if we assume that the advertising revenue function is linear, $R(n) = \alpha n$, with $\alpha < \delta$. Utility in the mixed funding regime is then equal to

(3.35) $u_1 = \frac{1}{2\gamma} - t$

Equilibrium advertising and quality levels in the advertising funded newspaper are in this example equal to

(3.36) $n_2 = \frac{t}{\delta}$

(3.37) $v_2 = \frac{\alpha}{2\delta\gamma}$

With these values, utility becomes

(3.38) $$u_2 = \frac{\alpha}{2\delta\gamma} - t$$

We have that $\alpha < \delta$. This implies that $u_1 > u_2$. Hence, if it is difficult to affect the quality of the newspaper, then the readers surplus will be higher in a mixed funding regime than in an advertising funding regime. If the newspapers can affect the quality level of their newspapers, reader welfare may, or may not, be higher when newspapers are not free of charge.

3.5. Using comparative statistics to measure the impact of more competition

One of the most important structural changes for newspapers in the digital era, is the increase in competition the newspapers now are facing. Online news sites compete with hundreds of other news sites, bloggers, and news aggregators.

In this section, we will look at the effects on the equilibrium outcomes in the two funding regimes, with special emphasis on quality, when the newspapers find themselves in a tougher competitive environment.

It is usual to refer to t as the degree of competition in the market. When t decreases, there is less differentiation between the two newspapers, which increases the substitutability between the two papers and intensifies competition.

3.5.1. Effect of more competition in case 1

We introduce tougher competition by letting t decrease and look at what happens with the equilibrium outcomes when the newspapers face tougher competition in the market. In fact, tougher competition has no impact on the equilibrium level of advertising and quality, as we can see from (3.17) and (3.18). However, it does have a negative effect on the equilibrium prices, which should not come as a surprise:

(3.39) $$\frac{-\partial p_1}{\partial t} = -1 < 0$$

There are two effects of tougher competition on quality. On the one hand, more competition has a direct effect on the incentives to supply high quality news as to attract more readers (remember that utility depends positively on quality). On the other hand, more competition has an indirect effect on newspapers' incentives because it reduces the price-cost margin of the newspaper,[91] which in turn reduces the newspapers' incentive to invest in quality. In case 1, these two effects cancel each other out, and there is no effect on the quality.

3.5.2. Effect of more competition in case 2

We introduce competition in the case where the newspapers are not charging for their news. This represents the online news industry, in which news are free and competition is fierce. The claims that news quality online is far below news quality in printed newspapers due to the rough competitive environment online are being explored in this section.

In the case where newspapers are fully funded by advertising revenues, more competition has an effect on both on the equilibrium level of advertising and equilibrium level of quality. The effect on the level of advertising is shown to be negative:

$$(3.40) \qquad \frac{-dn_2}{dt} = \frac{-\delta R(n_2)}{t R''(n_2) - \delta R'(n_2)} < 0$$

When the newspapers enjoy high market power, they are able to set advertising levels (and prices, if there are positive prices) according to their own economic interest. However, as competition increases, the newspapers lose market power and must to a greater extent consider the readers' preferences when deciding on advertising levels (and prices) in order not to lose the readers to their rival. Because we have assumed that readers dislike advertising, the equilibrium level of advertising therefore decreases when competition toughens.

The effect on quality of more competition is found to be positive:

$$(3.41) \qquad \frac{-\partial v_2}{\partial t} = \frac{R(n_2)}{2\gamma t^2} > 0$$

91 $\text{Price-cost margin} = \frac{p - \text{marginal cost}}{p}$

This theoretical result differs from the main point in section 2.5.3, i.e., that competition online hurts quality. However, in light of this model the result is actually not surprising. Given the fact that we have only considered a symmetric equilibrium, more intense competition will only have a direct effect on the newspaper's incentive to supply quality content. This is is due to the fact that prices are zero, so more competition will have no impact on the price-cost margin of the newspaper. Hence, because they are not able to lower their prices, they must increase quality in order to attract more readers.

4. Discussion

We have found that under the mixed funding regime, both the level of quality and advertising coincide with the socially optimal levels, and that under the advertising funding regime the level of advertising is too high and quality is too low in relation to what's socially optimal. This is because the newspapers are not able to capture any reader surplus following an increase in quality since they are not able to raise their prices. Hence, the newspapers' incentives to increase quality are low. In a simple way the model captures the notion that the quality of news online is lower than the quality of news offline.

However, we found that, contrary to the perception of most readers, editors and journalists,[92] quality actually increases with more competition when the newspapers are free. When competition becomes more fierce, quality and advertising levels converge towards the levels that are socially optimal. This does not concur with the fact that people have become more skeptical of online news over the years.

There are some important attributes of the Internet that this model does not capture and that may change the results derived in section 3.5. In the following section I will discuss some of the limitations of the model and how the results derived in the model may change as we change some of the assumptions we have made. Thereafter, I will include a small discussion about the relationship between competition and diversity.

4.1. Limitations and extensions

One important aspect that the model does not capture is the change in reading habits in the wake of the digital era. The model we have applied assumes that readers only consume one newspaper. While this is most often the case when the newspapers have a positive price (most people only *buy* or *subscribe* to one newspaper), it does not describe online behavior very well. Online behavior is characterizes by multi-homing, which means that consumers make use of several news outlets and not only one. In a more casual terminology it means that readers often visit several news sites and are seldom loyal to any one newspaper because it is not costly (in monetary terms) to consume more than one paper.

92 See quantitative research from Ottosen and Krumsvik (2010), pp. 20-21 and Pew Research Center's Project for Excellence in Journalism (2009).

In a more realistic model you might interpret a reduction in *t* as an increase in the likelihood that readers will multi-home because the substitability between the two newspapers increases as the horizontal differentiation between the newspapers decreases. When the readers are multi-homing, it is reasonable to imagine that they spend less time on any outlet compared to when they only use one outlet. When readers spend less time on each outlet, the probability that each reader is "impressed" by the advertisement is most likely lower compared to offline where most readers consume only one newspaper. It can therefore be argued that in the case where *t* represents the likelihood of multi-homing, the advertising revenue function of the newspapers, *R(●)*, might be negatively affected by increased competition. Hence, quality might be negatively affected by more competition online

because $\frac{\partial v_2}{\partial(-R)}<0$ .This is seen from (3.27).

In the applied model, the advertising revenue function is identical in the two cases. However, it may be closer to reality to assume that revenues per advertisement is *higher* whenever the newspaper is paid for compared to when it's free. This is related to the concept that people tend to value things more when they pay a higher price for it.[93] In the case of newspapers, this may involve spending more time on the newspaper and browse the newspaper more than once. When the newspaper is free, on the other hand, there are no monetary costs involved in the consumption of news. Throwing away a free newspaper, or leaving a free news site without having read through all the content, does not amount to a utility loss. Hence, when the newspaper is paid for, the reader signals an interest in the newspaper's content as he is willing to pay a price for it, and expects that the utility acquired by reading the paper at least exceeds the monetary cost. This suggests that the average reader spends more time reading a paper that is paid for relative to a paper that can be obtained for free. This implies that advertisements are more valuable in a priced paper compared to in a free paper, which would imply that $dR/dp > 0$. If this is the case, then content quality online will be lower than predicted in the model.

Up until now, we have only discussed the effect of competition on free news, or as I have interpreted it, on digital news. However, it is fair to assume that the access of free news online will also have an effect on news offline. If free online news are "cannibalizing" print sales, which some studies have suggested it in fact does,[94] then printed newspaper may lose readers to digital platforms,

93 See the interview with Dan Ariely, a behavioral economist at MIT, in *The News York Times*: http://www.nytimes.com/2008/03/19/health/19iht-ariel.1.11252785.html?_r=1&pagewanted=all, accessed March 11, 2012.

94 See e.g. Gentzkow (2007) for empirical evidence that online news sites are cannibalizing sales of printed

and both sales revenues and advertising revenues will fall, and *competition* from online platforms may have a negative effect on the quality of printed newspapers.

We saw in section 3.4.2 that the quality level offline coincides with the social optimum while the quality level online is too low. News production entails positive externalities, as discussed in section 2.4, which we have not accounted for in the welfare analysis. This may suggest that the quality levels in both funding regimes are too low relative to the social optimum. However, due to the fact that the newspaper companies are able to set a positive price on the their newspaper in the mixed funding regime, quality will always be higher in the mixed funding regime compared to in the pure advertising funding regime.

4.2. Diversity

In the model above we assumed that the newspaper "profile" is fixed,[95] and we showed that competition has a negative effect on quality when the newspaper is purely funded by advertising. However, it is interesting to discuss to what degree the newspapers will differentiate themselves from their rival when they have the opportunity to choose the degree of differentiation themselves.[96] In other words, we will discuss the degree of diversity when the newspapers can choose their own profiles.

The term "diversity" can at times be unclear. In the following I will define diversity as a great variety of product variants and that the consumers differ in their opinions as to which variant is the best or most preferable. I will not base this section on mathematical derivations, but rather on an intuitive and illustrative explanation of the different diversity outcomes in the different funding regimes. I will also investigate how diversity may be affected by more competition in different funding regimes. The following sections are to a large extent based on the simple explanations by Kind and Møen (2011).

We still use the Hotelling-model framework with two newspapers, uniformly distributed readers, and we still assume that advertising revenues are increasing in the newspapers' readership. However, we now assume that quality is exogenously given. They can differentiate themselves by choosing a specific political profile or choose to focus on a specific genre or news topic. We assume

newspapers.

95 We assumed that the newspapers were located at each end of the Hotelling line.

96 In this model this means that they can choose their location on the Hotelling line.

that some readers like newspapers with a clear profile, while other like a more neutral newspaper (in *figure 14*, those readers are positioned around M).

Let us assume that each of the newspapers need to choose a political profile, and that newspaper A's initial location is profile *l* (moderate left), and newspaper B's initial location is profile *r* (moderate right), as shown in *figure 14*:

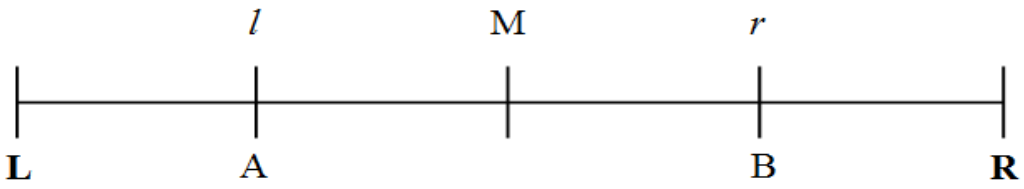

Figure 14: Political profile

All the readers to the left of *M*, will prefer and choose newspaper A because this profile suits their political stance better than newspaper B, and the readers to the right of *M*, will prefer and choose newspaper B. The endpoints represents an extreme left- or rightwing political profile of the newspapers.

The question we can ask here is whether these choices are optimal or not, and if not, what are the optimal choices of the newspapers? Where on the Hotelling line should they locate themselves? The answers to these questions depends on the newspapers' funding regimes.

4.2.1. Advertising funding regime

In the case where advertising revenues are the newspapers' only source of income, the newspapers want to choose the political profile that maximizes the number of readers as this maximizes total advertising revenues. Looking at the figure above, it is clear that the choice of profiles, *l* and *r*, is not optimal for the newspapers.

From newspaper A's position, we see that the optimal strategy is to position the paper a little bit to the left of *r*. In that way, newspaper A captures a much larger share of the market and hence receives more in advertising revenues. The same is true for newspaper B; he wants to position himself a little to the right of *r* in order to attract more readers. The equilibrium outcome will be such that the newspapers choose (almost) the exact same profiles, or they choose to differentiate

themselves as little as possible from the rival newspaper. In the eyes of the readers, the newspapers are exactly the same, and the newspapers get half of the market of readers each.

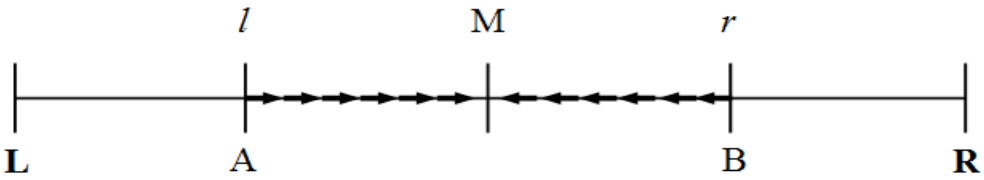

Figure 15: Equilibrium outcome (principle of minimum differentiation)

The equilibrium choice of profile is also known as the principle of minimum differentiation. When the newspapers do not compete in prices, they go "where the demand is", which in this case is in the middle. This captures what we discussed in section 2.4.3, i.e., that newspapers tend to shift their editorial material to more mass appealing material. This amount of differentiation is usually too low seen from an efficiency stance.[97]

If we relax the assumption on exogenous quality levels, the intuition from the theoretical model in part 3 tells us that as the newspapers move towards the middle in an attempt to capture a larger share of the readers, the newspapers will increase quality as a response to tougher competition for readers. If the newspapers choose a higher degree of differentiation, competition for readers is relaxed, and it will be optimal to invest less in quality. Therefore, it can be argued that there is a trade-off between diversity and quality in an advertising funding regime.

4.2.2. Purely subscription funded

Let us now assume that the newspapers are purely funded by subscription fees or single-copy sales. Further assume that the newspapers choose the same profile, as in the case above. In this case, the newspapers are exactly equal in the eyes of the readers, and they will choose the paper that has the lowest price. Hence, in an attempt to capture the whole market, the rival newspapers will engage in a simultaneous price war, and the newspapers will end up setting prices equal to marginal costs. This is known as the Bertrand paradox. To avoid this and relax the price competition, the newspapers will choose a higher degree of differentiation.

97 Kind and Møen (2011), p. 10.

There are two opposing effects at work in this case. By getting closer to your rival, you capture a larger share of the readers, but by moving away from your rival, you relax price competition. When the newspapers are deciding on their profile, these two effects are taken into account. In an extreme case, the newspapers would want to locate themselves at each of the endpoints and we would have full differentiation of the newspapers. This is known as the principle of maximum differentiation.

In the case where newspapers are funded by both subscription fees/single-copy sales and advertising, the equilibrium outcome could either be too little or too much differentiation compared to the social optimum. This depends on the specific newspaper structure (production function, cost function, demand function etc.). However, the more dependent on advertising revenues the newspaper is, the less differentiated it will be, and the more dependent on subscription revenues/single copy sales the newspaper is, the more differentiated it will be.[98]

The experience of both the Norwegian and the American industry of disaffiliating themselves from political parties have been linked to the increased dependence on advertising revenues over the years.[99]

4.2.3. Effect of competition

Kind and Møen (2011) argue that in the case where the newspapers are fully funded by advertising, diversity tends to be too low, and when the newspapers are fully funded by subscription revenues/single copy sales, diversity may be too high.

There has been some concerns regarding the increase in concentration of ownership in the newspaper industry, which has characterized the development in both Norway and in the U.S. High concentration of ownership may reduce competition in the newspaper industry, and some fear that the lack of competition may undermine the newspapers' role as watchdogs.[100]

On the other hand, newspaper organizations like Norwegian *Schibsted* are pushing for higher legal ownership limits,[101] and in 2009, Nancy Pelosi, then Speaker of the United States House of Representatives, argued that newspapers should be given leniency under anti-trust laws so that they

98 Kind and Sørgard (2011), p. 37.
99 Kind and Møen (2011), p. 9.
100Kirchhoff (2009), p. 2.
101 "Fusjoner kan styrke mediemangfoldet", *Kampanje*, November 30, 2012: http://www.kampanje.com/medier/article5827384.ece, accessed March 19, 2012.

can "*find ways to remain viable and pursue their vital democratic role*".[102]

Higher owner concentration may have two opposing effects. Large companies may run more efficiently (due to economies of scale), which may be reflected in lower prices for consumers and higher content quality. On the other hand, higher market power may result in higher prices for consumers and low incentives for providing high quality content and to invest in innovation.[103] However, because of the two-sidedness of the newspaper market, higher owner concentration is unlikely to have the latter effect on prices.

In this section, we will look at the implications of more competition (both in terms of higher owner concentration and additional newspapers), and whether or not high market power hurts the diversity of the press.

We saw in section 4.2.1 that under an advertising funding regime with two newspapers, the competition for readers will lead to minimum differentiation between the two newspapers. In the eyes of the readers the newspapers are equal. This suggests that the diversity online is low.

Assume now that the two newspapers are under the same ownership. Then the owner wants to maximize total readership which translates into *minimizing* the distance between the newspapers and the readers. Hence, when the two newspapers are under the same ownership, the two newspapers will serve different preferences instead of trying to steal business from the rival newspaper. This implies that higher owner concentration leads to more diversity instead of duplication compared to when the two newspapers are competing. A numerical example may make this easier to see.

Assume that there are three groups of readers; one group prefers a neutral paper, the second group prefers a left-winged paper, and the third prefers a right-winged paper. Let us assume that total audience in each group is 100, 30, and 25, respectively. In the case where the two newspapers compete against each other and their only source of income is from advertising revenues, both paper will choose the profile of a neutral newspaper, split the market, and get 50 neutral readers each. This is the strategy that maximizes the total audience for each newspaper. Assume now that the two newspapers are under the same ownership. The owner of the newspapers wants to maximize the total audience for both newspapers. Hence, one newspaper will have a neutral profile and win an audience of 100, and the other will have a leftist profile and win an audience of 30, which secures

102 "US House speaker urges easing competition laws for newspapers", *The Guardian*, March 17, 2009: http://www.guardian.co.uk/media/2009/mar/17/pelosi-newspapers-anti-trust-leniency, accessed March 19, 2012.
103 Kind and Sørgard (2011), pp. 8-14.

the owner a total audience of 130.

Assume now that we add more competition from rival newspapers in the case where newspapers are fully advertising funded. Added competition will have a positive effect on diversity if the share of audience left unserved is greater than the share of audience obtained by stealing business from the other newspapers by choosing the same profile. The more newspapers there are in the market, the more likely it is that the optimal strategy is to serve the less popular genres instead of duplicating. We can see this from the numerical example above. With two rival newspapers, they will split the neutral market and get 50 readers each. If there are three newspapers, they will still choose a neutral profile because this gives them around 33 readers each. However, as a fourth newspaper enters the market, he can choose the same profile as the other newspapers and take ¼ of the market (which is equal to 25 readers) or serve one of the unattended audiences. Because choosing a leftist profile gives him 30 readers, he will choose this profile instead of the neutral one.

According to Kind and Sørgard (2011), the outcome in the case where the newspapers are under a mutual owner will correspond to the optimal level of differentiation. However, the benefit of concentration of ownership does not apply as easily in the case of a mixed funding regime as in the case of an advertising funding regime.[104]

We saw in section 3.5.2 that more competition has a positive effect on quality online. However, there are some important characteristics to the online market and consumer behavior that the model does not capture. The model may therefore not capture the true effects of more competition online. The common perception is that competition online hurts quality, and in section 4.1 I gave examples of some of the limitations in the model. We have also seen that diversity tends to be too low online as the newspapers choose a low degree of differentiation in the competition for readers. In light of these results, the suggestion by the Norwegian government to extend the press subsidies to online news outlets seems reasonable. Digital news outlets have over the years become one of the most important news sources. The positive externalities of quality news appear when they are consumed by readers, and the more individuals that read quality news, the bigger the ripple effects of quality news is. It is therefore important to ensure the quality of online news since many consumers of news are replacing their printed newspaper with news outlets online. Support to online news outlets will relieve some of the pressure of the newspapers to choose the strategy that maximizes readers. When the news outlets become less dependent on advertising revenues they

104 Kind and Sørgard (2011), p. 38.

might choose to invest more in quality journalism instead of content that receives “hits” in the short run. The less dependent the news outlets are on advertising revenues, the less they need to skew the content to match the preferences of the mass audience.

5. Conclusion

The purpose of this thesis was to discuss the impact of the digital revolution on the quality of news content, especially on the quality of news delivered online. The possible consequences for quality may have important implications because of the important societal and political importance of quality journalism and the increased popularity of online news, and should trigger a discussion around possible measures to shield the important roles of newspapers, also online.

In approaching these issues, I have used a spatial competition model with horizontal differentiation and compared a mixed funding regime and a pure advertising funding regime as a method of comparing offline and online news provision. I find that the level of quality in the mixed funding regime (printed newspapers) is higher than the level of quality in the advertising funding regime (online newspapers), where quality is assumed costly to produce. This is because higher quality can not be capitalized by the newspapers in terms of higher prices to readers. Moreover, the model finds that quality is positively affected by more competition (a reduction in the horizontal differentiation between the newspapers, t) online because the news outlets' only way to attract readers is to increase quality. Offline, there is no effect on quality because the positive and the negative effects of competition on the incentives to raise quality cancel each other out.

There are several assumptions in the model which are unrealistic, and which may make this model not fully explain the behavior of news providers, especially online. First of all, the theoretical model does not distinguish between differences in reading habits offline and online. The model assumes that the readers can only consume one newspaper. While this explains consumption of printed newspapers fairly well, it is a poor description of reading behavior online, where reading behavior is characterized by multi-homing. In a more realistic model, one might interpret a reduction in the horizontal differentiation between the newspapers as an *increase* in the likelihood of multi-homing by the readers. It can be argued that multi-homing decreases the probability that each reader is “impressed” by the advertisements because multi-homing most likely reduces the time spent on each outlet. If so, more competition will have a negative effect on the advertising revenue function of the newspaper, which will have a direct negative impact on the quality online.

Moreover, it can be argued that the advertising revenue function is not identical offline and online, which we have assumed in the theoretical model. It may be more realistic to assume that revenues per advertisement is higher offline than online. This is related to the belief that people

value goods more when it is paid for compared to when it is free. This suggests that people spend more time reading a printed newspaper compared to an online paper. This indicates that advertisements are more valuable in a printed paper than in an online paper, which means that content quality online will be lower than predicted in the model.

In addition, I have investigated the implications for diversity in a purely advertising funded regime (e.g. online news outlets). In a purely advertising funded regime, with quality being exogenously given, newspapers will choose to differentiate themselves as little as possible from the rival newspaper in order to attract more readers. Higher owner concentration will have a positive effect on diversity as the owner wants to maximize total audience. Adding more competitors may also have a positive effect on diversity, and it is more likely the more competitors there are.

If we relax the assumption on exogenous quality levels, the intuition from the theoretical model in part 3 tells us that as the newspapers become more alike in an advertising funding regime, newspapers will increase quality as a response to tougher competition for readers. The more similar profiles the newspapers choose, the more they have to increase quality. Therefore, it can be argued that there might be a trade-off between diversity and quality online.

The digital revolution has changed the economic foundation of the news providers in a profound way and the newspaper industry finds itself in a transition. Technological advances such as mobile devices, social media, and online video streaming open up for new sources of revenues for newspaper companies that may replace some of the lost revenues in the printed market over time. The changing environment in the news industry also opens for new research themes of economic importance. Proper understanding of the modern newspaper industry is therefore important in order to understand the determinants of quality of news content.

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